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REPORT
OF
SCIENCE FAIRS
HELD DURING 1962-63.



DEPARTMENT OF EXTENSION SERVICES
Government Training College, Trichur.
(Kerala State)

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GOVERNMENT TRAINING COLLEGE, TRICHUR.
(Kerala State)

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DEPARTMENT OF EXTENSION SERVICES
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Trichur, Kerala

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I. SCIENCE FAIR AT CHITTUR

1. INAUGURATION OF THE SCIENCE FAIR.

A Science Fair and Exhibition was held at the Government Girls' High School, Chittur from 29th November to 1st December, 1962. It was intended for Science clubs of Secondary Schools of the Educational Districts in the northern region. The fair was inaugurated on 29th November at 9 A. M. by Dr. A. S. Narayana Pillai, Principal, Government College, Chittur. The meeting was attended by headmasters, headmistresses and teachers of participating schools and a large number of invited guests besides the member-pupils of the science clubs. After welcome speech by Sri. R. S. Sambasiva Iyer, Headmaster, Government Boys' High School, Chittur, Dr. Narayana Pillai delivered the inaugural speech. In a very inspiring speech, replete with humour, Dr. Pillai stressed on the fact that the teaching of science should not be dogmatic and that the real aim of science teaching is to develop the scientific attitude in pupils.

GIST OF THE SPEECH DELIVERED BY Dr. A. S. NARAYANA PILLAI AT THE INAUGURAL MEETING

To the Teachers of Science:- The teaching of Science in our schools is a very responsible task. The teacher of science should, therefore, know clearly the nature of this task. He should know this so that he can equip himself better for his work.

I. Scientific attitude:- First what is the purpose of teaching science? One answer is that it is to give the young minds certain scientific facts in physics and

chemistry, biology and medicine, astronomy and geology. This is all right. But is this enough? If we stop with this, the pupil may have knowledge of several facts and may not know the scientific significance of these facts.

What is more important is the cultivation of the scientific attitude of mind in the pupils. It is more useful for the rising generation in this country to cultivate the scientific attitude of mind than to remember a few facts which have scientific interest.

1. Against dogmatism:- The scientific attitude is against the dogmatic attitude. Dogmatism kills curiosity. It does not care to 'explain'. It just believes. It is an attitude which makes a person believe in any thing without sufficient evidence. The mind must be trained to seek for the fullest evidence for any belief. It is clear that dogmatism must be given up if we want to adopt the scientific attitude. This may be difficult. In many cases the evidence will not be complete. In such cases the scientific mind will not believe: it will suspend its judgement. Belief must be on complete evidence. Without complete evidence no fully developed mind can believe.

2. Another Dogmatism:- There is also another kind of dogmatism which we must avoid. Just as some people are prepared to believe without sufficient evidence, others refuse to believe even in the fact of compelling evidence. The story of the old lady who could not believe that there is a creature like the giraffe illustrates the point. She thought such a creature could not exist because a long neck (like the one the giraffe has) is an absurdity. It could not be. She was taken to the zoo and shown

the giraffe. She looked at the animal for long and then said "I don't believe that there can be a giraffe". This, of course, is going against evidence, refusing to believe even against clear evidence.

Dogmatisms of both kinds (the right and the left) should be given up for developing the scientific mind. The reason why we are dogmatic is because we are unwilling to give up our pet prejudices or think differently. We must learn to give up our prejudices.

II. Humility:- The scientific attitude includes humility of mind. It is the awareness that what we have known is very small compared to what we do not know. The known expands the unknown. The more we know the more the mystery of the unknown deepens. The greatest scientists have always shown this humility. Newton, one of the greatest scientists of all time, says that we are like children gathering pebbles on the seashore while the great ocean lies beyond our reach. Knowledge is growing but the world is too big to be known even partially. This gives humility to the scientist.

III. Faith:- While the scientific mind makes use of reason for understanding the world, this reason itself depends on a deeper underlying faith. We may not know this always but when we examine our reason we will know this. This faith supports reason like the eye which scans the world but cannot see itself. Because the eye cannot see itself we cannot say that it does not exist. Without the eye nothing else is seen. The faith that underlies his scientific reason was best expressed by Albert Einstein who once said that his theories are all built on the faith that 'God works simply'. There must be a simple way of describing the universe!

I hope that you, as teachers of science, will remember the lessons given in the lives of the front-rank scientists. I hope you will realize what a thrilling job you are doing. You have to impart to young minds the curiosity to know, and the enthusiasm to investigate and experiment. Along with these it is your special task to cultivate the scientific attitude, humility and an abiding faith in the orderliness of the Universe.

I wish you all success in your responsible task.

2. SCIENCE TEACHERS' MEETING.

The fair began with the holding of a Science Teachers' meeting at 10 A. M. on 29th November, 1962. Sri. P. S. Vaitheswaran, District Educational Officer, Palghat Presided over the meeting. About forty science teachers from the High Schools in Chittur and surrounding places attended the meeting. In a short but impressive speech Sri. Vaithe- swaran said that much depends on the Science Teacher with regard to teaching science effectively and in an improved manner.

Sri. P.R. Subramania Iyer, Headmaster, Raja's High School, Kollengode then spoke on "Stimulation of interest in Science in America". He dealt at length with the museums and the planetarium in the United States of America and lastly about the T. V. Programmes used there for teaching Science very effectively. This was followed by a talk by Sri. T. N. Padmanabhan, Co-ordinator on "Improved Methods of Teaching Science in our Schools" when he dealt with the conditions prevailing in our schools with regard to science teaching and the way in which the subject is usually taught and lastly about the changes that should be brought about to improve Science teaching which are (1) Demonstration work by the teacher in which there should be active pupil participation (2) Group work by pupils in

the laboratory (3) Field trips and study tours (4) Science Club activities (5) Library work (6) Home assignments and (7) Projects.

The delegates then worked in four groups and discussed the topics (1) Aims of Teaching Science so as to suit the needs of our country at the present day (2) The High School Science Curriculum (3) Improved methods of teaching Science (4) Evaluation in Science. Incidentally they also discussed about the qualifications and the role of the Science Teacher and the minimum things to be provided in the school to carry on Science teaching successfully. The deliberations led to the following recommendations and suggestions.

Aims and Objectives of Teaching Science:- (1) To enable the pupils to acquire knowledge of facts, principles and concepts of Science necessary to understand the world around them and solve practical problems of everyday life (ii) To stimulate reflective thinking in various ways but chiefly by teaching boys and girls what the scientific method is and how to use it in solving their problems (iii) To develop those skills which help children in preparing simple apparatus for use in daily life (iv) To develop interest in scientific knowledge and in pursuing scientific hobbies (v) To develop scientific attitudes and appreciations of the life and work of great scientists and of the impact of science on our ways of life

The High School Science Curriculum:- General Science should be treated as a core subject like Mathematics. Elective sciences should be introduced in the High school classes and taught in standards IX and X and also in standard XI of Higher Secondary Schools. The syllabus in General Science may be lightened so that the students

may learn only the broad principles of science and their applications in everyday life. The concentric method need not be followed in the high school stage because we deal in these classes with pupils at one stage only so that interest does not go down. Practical work in General Science should be insisted and about 20 experiments a year should be done by the pupils working in groups. A double period per week should be set apart for practical work in the elective sciences.

Improved methods of teaching Science:- Activity methods should be adopted in teaching science. Major experiments which are difficult and complicated alone need be demonstrated by the teacher in the class. There should be active pupil participation in such demonstration lessons. The class must be divided into groups and each group should discuss the problem in the class and perform the necessary experiments in the laboratory. Laboratory work books should be maintained by the pupils. Field trips and study tours to museums, factories workshops and places of scientific importance should be planned carefully and carried out. A few projects may be carried out by the groups. Home assignments may be given and pupils may be asked to draw charts and diagrams, collect materials and make simple models. A science club should be started in every High School and students having special aptitude and talent for science should be encouraged to become members of the club. The work carried on in the club should supplement the study of science in the class.

Evaluation:- Evaluation in science must be a continuous process evenly spread throughout the course and it must satisfy certain requirements. It should test not only the knowledge obtained but also the skills involved in the mastery of such knowledge and its applications in solving

problems. Short answer and new type objective tests may be given periodically. Practical work done by the pupils may also be assessed. The allotment of marks for the internal and external assessment in General Science may be 40% and 60% respectively. External practical examination may be conducted for the elective sciences and the allotment of marks for theory and practical may be 60% and 40% respectively.

Qualifications of the Science Teacher:— First rate men based on merit alone should be selected as science teachers. Teachers should have a profound knowledge (theoretical and practical) of the branch of science they teach. Teachers should be acquainted with the up to date developments in science. Workshops, seminars and refresher courses for science teachers should be conducted from time to time. Special content courses in different fields of science also should be arranged for all science teachers.

Minimum Requirements:— To ensure effective science instruction, the strength of any science class should not exceed forty. The work load of the science teachers should not be more than 22 periods out of 35 periods per week as additional periods will have to be spent by the teacher on preparation for laboratory practical work, demonstrations, science club activities and correction of practical records.

Every High School should have a separate science block with one or two science classrooms and well equipped science laboratory. A laboratory attender must be appointed in each High School. The laboratory should be equipped with atleast the minimum apparatus and other science materials for demonstrations and practical work and the necessary furniture like demonstration tables, work benches for pupils, and sufficient number of shelves and cup

boards. Liberal allotments must be made every year for the purchase of science materials for the school and purchases must be made according to the needs of the school as suggested by the science teacher.

The science library should consist of sufficient number of reference books and scientific journals and magazines. Reference books in science in the regional language should be produced and every high school should be supplied with these books. Science magazines and journals in the regional language also should be brought about and the schools allowed to subscribe for them. Grants should be given for science excursions and for Science clubs.

(3) COMPETITIONS

Essay and Science Quiz competitions were held in the afternoon of 29th November and the extempore speech competition on 30th November afternoon. Sri. C. A. Vaidyanatha Iyer, Retired District Educational Officer Sri. H. Sreemulanathan, Vignan Mandir Officer, Pudur and Sri. M. Y. Prabhakaran, Professor of Physics, Government College, Chittur were kind enough to act as judges and decide the winners in the various competitions. 23 pupils competed for the essay, 33 for the quiz and 12 for the extempore speech competition.

(4) EXHIBITION

The Educational and Science Exhibition arranged in connection with the Science Fair was inaugurated on 29th November, at 3-15 P. M. by Sri. V. Ananthanarayanan, Professor of zoology, Government College, Chittur.

Substance of the speech delivered by Sri. V. Ananthanarayanan on the occasion of the inauguration of the Exhibition:-

I am extremely happy to be with you this evening and thank the organisers for having given me this opportunity to associate myself with this function. We are all aware of the fact that we are witnessing today the tremendous advances in the field of science and technology. We have witnessed the utilisation of atomic energy in producing equipments which could probe the conditions of our neighbouring planets. Similar advances have been made in the field of pure and applied sciences, medicine, surgery engineering, physical and biological sciences. It has therefore become obligatory on our part to be aware of the tremendous responsibilities we have to discharge, in creating an awareness in the minds of the younger generations, and kindle in them the creative genius and give them the necessary impetus to think and act in a scientific way.

This could be achieved in various ways. It is possible to organise clubs and societies in the various schools providing opportunities for the youngsters to meet often and discuss scientific problems. Study tours are to be organised by the authorities for the benefit of the students. They should be taken to factories and industrial concerns, and given a first hand knowledge of the working of these institutions. They should be trained in the making of simple models, and asked to make observation about the habits and life histories of plant and animal life around them. It may be argued that well equipped laboratories are not available in schools to carry out such programmes. This is an illconceived notion. What is really required is the initiative, enthusiasm and the willingness to work.

There are many facts which one could easily understand from nature, analyse them and unravel the mysteries. In this connection I would like to mention that one of the greatest contributions to science during the present century is the analysis of the language of the bees, so ably accomplished by the famous biologist Von Frisch, as a result of patient observation and study for a fairly long period without much of equipments. So it is possible to carry on such studies and make the students feel that they can also make little contributions in their limited ways.

In this connection it has to be clearly understood that these programmes should be planned on sound lines and herein lies the responsibilities of the science teachers. Over emphasis on scientific studies has always the danger of making the students feel that they can neglect the studies of art, literature and other humanities. It is for the teachers to see that this does not happen, which will be too disastrous to imagine. The guided programmes should envisage activities enabling the students to think and act in a scientific way. They may not remember the scientific details they study, but it is the method of science that is all important.

I take this opportunity to appeal to you, to always keep an open eye and try to understand the mysteries of nature and the marvels of the modern world. In this great venture to acquire knowledge, I congratulate the officers of the extension services on the excellent work that they are doing and wish them all success. With these words I formally declare open the science exhibition and congratulate the young boys and girls who have presented the large number of exhibits on this occasion. I once again thank the organisers for giving me this opportunity to associate myself with the students and teachers who have assembled here on this occasion".

The exhibition was formally opened at 4 p. m. by Sri. Ananthanarayana Iyer. The president and all the guests present, went round seeing the exhibits arranged in twelve class rooms.

Six Science clubs contributed separate stalls to the exhibition. The Vignan Mandir of Pudur had a special stall where their exhibits were displayed. The special feature of this exhibition was that the exhibits displayed were mostly those made by the pupils. Books, charts, maps and globes of the Extension Services Department were also displayed at the Exhibition. The working of the projectors of the department was shown to the visitors. Puppet plays and film-shows were also arranged in connection with the exhibition.

The exhibition was kept open for two days (30th November and 1st December, 1962) and more than 3000 persons (students and teachers) saw the exhibition.

The more important exhibits made by pupils and displayed in the various stalls are given below:-

1. Government Boys' High School, Chittur:-

Biology:- Clay models (painted) of heart, kidneys, tooth, ear and lungs, artificial lungs, collection of insects and seeds herbarium, preserved specimens of cobra and other snakes, flying fox and crabs, feather collections; Biological charts—the evolution tree, models of vegetables made out of plastics, agricultural implements made by the students; varieties of paddy collected from Chittur Taluk; relief map of India (clay model)

Chemistry:- Exploding soap bubbles, soap making, safety matches, silvering of mirrors, magic writing, fire

writing, cold flame, chemical vegetation, crystals grown by pupils, home made apparatus—spirit lamp, test tube stand, tripod stand etc.

Physics:- Model of Hydro-electric scheme, house wiring, electric buzzer, electric bell, stair case switch, Tanjore doll, Centre of gravity toys, Toy train, magic box, electric brain, science quiz, stethoscope, convection apparatus.

2. Raja's High School, Kollengode:-

Samples of minerals of India, rayon, terylene, wheat—from grain to flour, different varieties of paddy, seeds, paper—different varieties, quiz board, telescope, periscope feathers of birds, skin of mountain squirrel, samples of leather, aeroplane model, paper record, collection of shells, skull of a dog, outer skeleton of a turtle, chem-craft with chemicals, herbarium showing plant diseases, vernier (hand made,) balance (hand made) Physics charts, Biology charts.

3. Govt. Pandit Motilal Secondary School, Palghat:-

Preserved specimens of embryos of cow and buffalo, embryo of chicken with two heads, Jaw bone of Saw-Fish, ores of metals, sea shells, different kinds of mica, mineral sands of Kerala, Buzzer, electric bell, radio model made by pupils, different kinds of timber, Album—physiological transparencies.

4. St. Paul's High School, Kozhinjampara:-

Automatic switching arrangements, transistor set 3. L.D Resistance, Photographic tricks, clay models of sea animals electric bell, D. C. Motor, Science charts.

5. Government Girls' High School, Chittur:-

Centre of gravity experiments, carterisn diver, water wheel, pressure in liquids varies with depth, pulley system, regelation, steam engine, telegraph model, dynamo, re-reflection by parallel mirrors, soap making, home filter pots Physiology models; Physics, Chemistry and Biology charts.

6. N. E. High School, Alathur:-

Science Manuscript Magazine, picture albums, herbarium sheets, science scrap book, Folders containing collections of newspaper cuttings and articles from journals, Physics, Chemistry and Biology through charts, models of periscope, kaleidoscope, pinhole camera etc.

7. Vignan Mandir Pudur:-

Human foetus of 2 months, 3 months, 4½ months, 6 months and 10 months—Foetus of sheep, cow and buffalo. Internal organs of man and animal like lung and heart. Zoological specimens like cocoons, scorpion, crab, prawn, sepiis tortoise, fishes, draco, ant eater, venomous and non venomous snakes like viper, cobra, krait, rat snake and water snake—duck twins. Insect boxes displaying the various harmful and beneficial insects. Preparation and preservation of simple dissections of rabbit, rat, frog, calotis etc; depicting the internal structure; Skeletal system of frog, field rat, turtle, dove, ant-eater skull etc. Stuffed birds like blue jay, white headed babble, house sparrow, dove etc. Different varieties of paddy, cereals and pulses,—manures and fertilisers with their nutrients. Herbarium sheets of local plant specimens. Working models of telephone, electric motor, oil engine, steam

turbine, electric bell etc. Charts illustrating the biology of the human body and other scientific charts. Books on scientific subjects.

5. STUDENT'S MEETING:-

Students' meeting was held on the evening of November; 30 Sri. C. A. Vaidyanatha Iyer, Retired District Educationa Officer, presided over the meeting. At the meeting the reports of the Science clubs which participated in the Science Fair were read by the secretaries. That was followed by the reading of seven papers in Science by the pupils and the performance of a few tricks in science by the pupils of Govt. Boys' High School, Chittur.

Synopsis of the talk given by Sri. C. A. Vaidyanatha Iyer:-

“The students have to learn several important lessons for life from their participation in the Science Fair. The most important lesson is that learning will be most effective only if it is accompanied by an appropriate activity. For instance, drawing charts and diagrams, arranging apparatus, making models and so on, would help very much in impressing on their minds, the principles of science which these activities demonstrate. Writing essays, making extempore speeches and taking part in the meetings are all very educative experiences. Again, they can learn from the Science Fair, the best way of working with others as a team for a common purpose. Such opportunities for service should be availed of by them because they will be a source of real joy to them. In fact, such joy is the real reward for all such unselfish activity. They have also to remember that the real value of the exhibits lies in their quality and not in their quantity. There is a fatal tendency among our people to judge the progress

of any movement by the quantity of its products rather than by their quality. This is an age of Science and Technology and so it is essential that students should take to the study of Science if they have the aptitude for it. Science clubs and activities like the conduct of Science Fairs will help them in their study though they may not be useful in preparing them for the examination. But they have also to remember that mere devotion to Science without spirituality has brought the world to the brink of total destruction. In fact, a nuclear war will destroy civilization as we know it today. Hence they have to realise the urgent need for what may be called the Science of the Soul. This is also as much a science as the science that concerns itself with matter. Only, its field of study and the apparatus used are different. Gandhiji called his autobiography "Experiments with Truth". Science and spirituality are, therefore, the supreme need today".

6. VALEDICTORY MEETING

The valedictory meeting was held on the evening of 1st December, 1962, at 3 P. M. Sri. T. Paul Verghese, Honorary Director of Extension Services presided over the function. The Co-ordinator gave a brief account of the Science Fair after which Sri. Verghese gave a very impressive and interesting speech on the values of running Science Clubs in High Schools and conducting Science Exhibitions. He said that Exhibition is visual and practical education and that only the best exhibits made by the pupils should be exhibited. He further said that exhibitions should not turn into lengthy demonstrations. Exhibits should be planned and arranged in such a way that they should be self-explanatory and that the visitors should be able to capture the idea we want to convey quickly.

Prizes and certificates were then awarded to the winners in the various competitions. With a vote of thanks by Sri. S. Pazhaniappan, Science teacher, Govt. Boys' High School, Chittur the function came to a successful conclusion.

LIST OF PRIZE WINNERS

1. Essay:

- I. K. Sarojini. Govt. Victoria Girls' High School, Chittur.
II. C. Narayanankutty Govt. Boys' H. S. Chittur.
C. M. Raghunath.

2. Extempore sheech:

- I. P. Ravindran. Pandit Motilal H. S. Palghat.
II. A. Venkiteswaran Govt. Boys' H. S. Chittur.
M. Appukuttan. Raja's High School, Kollengode.
III. C. K. Lakshmy. V. G. H. S. Chittur.
C. Narayanankutty. Govt. Boys' H. S. Chittur.

3. Science Quiz:

- I. A. Rathy. V. G. H. S. Chittur.
II. M. Saraswathy. —do—
III. M. P. Raghunandan Govt. Boys' H. S. Chittur.

4. Reading of paper:

- I. C. Ravindran. Govt. Boys' H. S. Chittur.
II. U. Kuttikrishnan. —do—
K. Vibinmohan. —do—

5. Exhibits:

(i) Charts—Physics:

- I. K. G. Venkitasubramanian. R. H. S. — Chain drive.
Kollengode
- II. P. Venugopal. -do- — Wedge.
- C. K. Balasubramanian, B. H. S. — Cells.
Chittur.

(ii) Charts—Chemistry:

- I. B. Manonmani. V. G. H. S. — Burning of
Chittur. Hydrogen.
- II. R. Janakiraman. St. Paul's H. S. — Contact
Kozhinjampara. Process.

(iii) Charts—Biology:

- I. Sudhakaran. B. H. S. Chittur. — Evolution
Tree.
- II. R. Janakiraman St. Paul's H. S. — Digestive
Kozhinjampara. system &
fish
- T. A. Sudha. V. G. H. S. — Life History
Chittur. of Mosquito.

(iv) Models—Physical Science:

- I. Anwar Batcha. St. Paul's H. S. — Automatic
Kozhinjampara. light switch-
ing.
- II. Bellarmine. B. H. S. Chittur. — Hydro-elec-
tric Project
- III. S. Pazhaniappan. -do- — House
Connection

(v) Models—Natural Science:

I. Thangavel swamy St. Paul's H. S. — Seanemon
Kozhinjampara. model.

II. E. Krishnaswami. B. H. S. Chittur — Ear model

(vi) Collections:

I. Krishnankutty. Raja's H. S. — Diseased
Kollengode. plants.

II. G. Hariharan. B. H. S. Chittur — Seeds and
leaves.

(vii) Experiments — Chemistry:

I. C. V. Vaidyalingam B. H. S. Chittur — Soap bubble
R. Ramachandran explosion.

II. Group Experiments:

a) Soap and Match making:

1) A. Kuttikrishnan. B. H. S. Chittur.

2) Hariharan. -do-

3) K. C. Kesavan. -do-

b) Soap Making:

1) M. Vasantha Bai. V. G. H. S. Chittur

2) K. Arunce. -do-

3) Y. Santhakumari. -do-

4) S. V. Jalajee. -do-

5) C. P. Vijayalakshmi. -do-

Special prizes

a) Scientific Magic:

1) A. Kuttikrishnan. B. H. S. Chittur.

2) K. Vibinmohan. -do-

3) Y. Parameswaran -do-

b) Puppet show:

- 1) A. Vijayalakshmi V. G. High School, Chittur
- 2) P. S. Ratnavalli -do-
- 3) A. Visalakshy -do-
- 4) Padmasankar -do-
- 5) C. R. Lakshmy -do-
- 6) C. P. Retnam -do-

List of Science Teachers who participated in the Fair.

- 1) Sri C. S. Ramachandran Govt. B. H. S. Chittur.
- 2) ,, C. S. Pazhaniappan -do-
- 3) ,, S. Venkitaswami -do-
- 4) ,, M. C. Madhavan -do-
- 5) ,, R. Jayadevan -do-
- 6) Sry K. Githa -do-
- 7) Sri C. A. Gopalakrishna Iyer V. G. H. S. Chittur.
- 8) Sry C. Y. Kallianikutty -do-
- 9) ,, Leela John -do-
- 10) ,, C. V. Rajalakshmy -do-
- 11) Sri C. G. Rajasekharan Raja' H. S. Kollengode
- 12) ,, T. K. Gadhadharan -do-
- 13) ,, P. Bhaskaran -do-
- 14) Sri M. Sethumadhavan -do-
- 15) ,, M. N. Subramanian -do-
- 16) ,, C. Bhagavathi Perumal St. Paul's H. S.
Kozhinjampara.
- 17) ,, M. Natesa Menon -do-
- 18) ,, A. N. Thangappan -do-
- 19) ,, M. V. Ittoop -do-
- 20) ,, C. C. Lakshmanan Govt. Pandit Motilal
H. S. Palghat
- 21) ,, P. P. Yateendran -do-

II. SCIENCE FAIR AT ALWAYE.

(1) Inauguration of the Science Fair and Exhibition.

The Science Fair and Exhibition was held at the Government High School, Alwaye from 28th to 30th January, 1963. It was intended for clubs of High Schools in the Ernakulam Area. The Fair and Exhibition was inaugurated on 28th January, 1963 at 10-30 A. M. by Dr. P. M. Mathai, Principal, Union Christian College, Alwaye. The meeting was attended by headmasters, headmistresses and teachers of high schools in Alwaye and surrounding places and a large number of invited guests besides the member pupils of science clubs. After welcome speech by Sri. T. Vallabhanunny Menon, Headmaster, Govt. High School, Alwaye, the Co-ordinator explained the circumstances that led to the conduct of the Fair and Exhibition and gave an account of the competitions proposed to be held in connection with the Fair and the nature of the exhibits arranged in the halls. Dr. Mathai then delivered the inaugural speech. In a short but instructive and interesting speech he said that science can develop only if we develop the scientific attitude and that the holding of Science Exhibitions in schools is one of the best methods of Teaching Science as students get an opportunity to learn everything by doing.

Synopsis of the speech delivered by Dr. P. M. Mathai at the inaugural meeting:-

1. "Nations leading in Science have been leading the world. James Watt discovered the steam engine and so England became an empire. Otto discovered the otto engine and so Germany became a rival to England. Europeans could easily conquer America because the gun

was superior to the bow and arrows of the Red Indians. The west will still lead the world because they have got the upper hand in the utilisation of atomic power.

2. Science can develop only if we develop the scientific attitude. This attitude must be seen in our day to day life—in keeping our things in good conditions—in developing the spirit of conquering nature by human effort—in our attempt to discover new things. This spirit should permeate our homes. Degree holders in science 'fall back to nature' worship to just following nature.

3. Our teachers and parents have a part to play in this respect. Science Exhibitions such as the one we are inaugurating today help the students in making new things”

The exhibition was formally opened at 11 A. M. by Dr. P. M. Mathai after which the president and all the guests present went round seeing the exhibits arranged in the various halls.

2 EXHIBITION.

On the whole nine high school science clubs participated in the Fair. Science clubs of six high schools contributed separate stalls for the Exhibition. The clubs of Govt. High School, Alwaye, C. N. N. Boys' High School, Cherpu and Asram High School, Perumbavoor sent a few best exhibits made by their member-pupils to be displayed at the exhibition. In this exhibition also the exhibits displayed were mostly those made by the pupils. Books, charts and maps of the Extension Services Department and posters and booklets relating to the defence efforts of our country were displayed at the exhibition. The working of the projectors of the department was also shown to the visitors. Regular film-shows were arranged throughout the exhibition

time during all the three days of the exhibition. Educational films and films relating to National Emergency received from the District Publicity Officer, Trichur were screened continuously to visitors in batches of about 300 at a time.

The exhibits were housed in 11 class rooms and the film-show was arranged in a big hall. The exhibition was intended for teachers and students of secondary schools only. It was kept open for three days (28th to 30th January, 1963) and about 6500 persons (students, teachers and invited guests) saw the exhibition. Owing to the large number of visitors that came on the second day (29th February) the Science Teachers' Meeting proposed to be held on that day had to be cancelled.

The more important exhibits made by pupils and displayed in the various stalls are given below:

1. Govt Boys' High School and (2) Govt. Girls' High School, Parur:

Chemistry:— Exploding soap bubbles, smoke without fire, magic pen, silvering mirrors, fire extinguisher, quick silvering, soap making, dancing soap bubbles, explosive area, bleeding skull, fortune teller etc.

Physics:— Test your lung power, thirsty doll, syphon fountain, thousand images, guessing game of electric bulbs, hand made episcopes, centre of gravity toys, toy gun, kaleidoscope, periscope, viewmaster, induction coil, toy cinematograph, sodium vapour lamp.

Biology:— Model of lungs, preserved specimens of snakes, octopus, and tape worm, life history of frog and the butterfly, stuffed specimens of birds, sea shells, seeds collection of various kinds of bones.

Physics, Chemistry and Biology charts—various.

3. Brahmanandodayam High School, Kaladi:-

Mechanical brain, telegraph, electric bell, electric horn, automatic switching, magic electric light, simple cell from lemon, refraction bottle, Newton's colour disc; crystal models with straw, distillation apparatus—improvised model, shifting pendulum, improvised common balance experiment with floating egg, solids floating in different liquids, convection apparatus, air thermometer, fire extinguisher, collection of 46 kinds of paddy seeds, preserved cobra, floating frog; Physics, Chemistry and Biology Charts.

4. Naval High School, Cochin:- Water girl, dancing doll, rocket, magic box, working of television, candle burning in water, sympathetic vibrations, centre of gravity toys, double cone going up an incline.

5. St. Mary's Convent Girls' High School, Ollur:- Clay models—transverse section of skin, kidneys, parts of a flower. Albums—Pictures and feathers. Collections:- Insects shells and seeds, skeleton of frog. Models:—telegraph, electric brain, parallel mirrors, kaleidoscope. Experiments:—Dancing balls, magic serpent, smoke without fire, fireworks Charts.

6. St. Teresa's Convent Girls' High School, Ernakulam: Biology charts, collection of shells, shell work, biological collections, albums of feathers, flowers and leaves, pictures of birds and animals, seeds, fruits, bones of animals, stuffed birds, homes of birds and insects, surface tension, resonance, vibrating air columns, hand made sonometer, propagation of light, periscope kaleidoscope, parallel mirrors, static electricity, diving duck and telegraph model.

3. COMPETITIONS.

Essay and Science quix competitions were held on the afternoon of 28th January and the extempore speech competition on 30th January afternoon. Sri. P. G. Kesava Potti, Physics lecturer, Sri. K. M. Koshi, Chemistry lecturer and Sry. K. Sakuntala Devi, Botany lecturer of the Union Christian College, Always acted as judges and decided the winners in the various competitions. 22 pupils competed for the essay, 23 for the quiz and 12 for the extempore speech competition. The preliminary selection of candidates for each of these was made by the schools which sent its club members for the final competitions.

4. VALEDICTORY MEETING.

The valedictory meeting was held on the evening of 30th January, 1963. Sri. T. Paul Verghese, Honorary Director of Extension Services presided over the valedictory function. After welcome speech by Sri. N. Viswanatha Iyer, Science Teacher, Govt. Boys' High School, Parur the reports of the activities of science clubs which participated in the Science Fair and Exhibition were read at meeting by the secretaries of the respective clubs. That was followed by the reading of a paper on "How we launched a Rocket" by S. Sreedhar, leader of one of the groups of the Science Club of Naval High School, Cochin Sri Paul Verghese then delivered the valedictory address when he spoke about the importance of running science clubs and conducting Science Fairs and Exhibitions in High Schools and lastly stressed on the development of the scientific attitude in pupils. Prizes and certificates were then distributed to the winners in the various competitions. The function ended with a vote of thanks by the Co-ordinator to all who contributed to the successful conduct of the Science Fair.

REPORT ON THE ROCKET LAUNCHED BY THE SCIENCE CLUB OF NAVAL HIGH SCHOOL, COCHIN

I stand here to place before you the report on the successful launching of a rocket which we made. The group members were S. Sreedhar, Balingibhan Bhattacharya, D. Narayana Moorthy and Srinivasa Bhakta.

Our Science master Mr. A. C. De. Almeida who is the sponsor of our club stressed on the importance of Science and the skill in theoretical and practical Science. He said "If you cannot do something with your own hand of what you have studied, then you have actually not studied". He encouraged us. We decided to carry out a good project.

While we were discussing about the project we had to carry out we came on to talk about Americans and Russians and their rockets. Then one of us suggested the making of a rocket. At first it seemed impossible but at last we postponed the discussion to the next day so that we might have time to think over it.

The next day suggestion came and the making of the rocket seemed possible. We had to have two parts: one the main body and the other the ammunition part in which the fuel mixture was to be kept. Now the two parts should be proportionate, That took quite a deal of work from us. Everyday new dimensions were suggested and the old ones were scored off.

We took the project proposal form from the Secretary and we filled the form. We requested for a month's time to complete it. Our project proposal was sanctioned by the committee.

Now we knew our work well. Our ammunition consisted of Potassium Nitrate, Sulphur, charcoal powder and iron filings.

□ We decided to make two pipes jutting out at the front part to let out the gases produced in the fuel chamber. The rocket was welded of many parts and round iron pieces with holes in the welded points were kept so as to give force to the rocket. We made the rocket out of zinc while the small part was made out of copper. Here we made a mistake. We brazed the copper piece instead of welding it. We found the mistake later. We toiled hard and we jumped with joy when we finished it. I still remember I tell you it was 5-30 P. M; 6th October Monday 1962 when we finished our last bit of work.

□ The next day we showed it to our Science Master who was very much pleased and the firing was to take place the next day.

□ The 8th of October, 1962 was a memorable one. I would never forget it. Our Science master gave sanction to fire the rocket after school hours. We did not keep the rocket vertically but we kept it horizontally (because we were forbidden to send anything vertically at the National base). We charged the rocket with fuel. It was placed on a raised platform. We wanted to make the firing as Americans and Russians do. One of us took the stop-watch and began to count the time. At 5'o clock the firing was to take place. Only a selected few were there. The firing rod was got ready. Our Master announced 20 seconds more. Our nerves got stirred up, our eyes brightened with anxiety at what was going to happen. Time moved on. Our Master announced 10 seconds more. All our eyes got fixed on the rocket. I began to count. Nine—eight—seven—six—five—four—three—two—one—fire! Immediately the rocket began to roar. In an instant a curious thing happened. A loud noise like the sound of shots was heard. With in a wink of an eye the rocket was off—it dashed with tremendous force against the

school wall towards which we had directed it. The fuel chamber went diving through the grass for about 500 yards and got plunged into the soil. The reason was that the holes in the round iron pieces which I had already mentioned were too fine to allow the gases to get through them. Therefore the air was compressed and because the two parts were only brazed and not welded the parts separated. The main body shot forward, the hind part recoiled back. Thus our first attempt was a great success and it gave room for us to think and study more about it. We are now preparing our second one rectifying our defetes.

We fully assure that our minds are stirred up and now we cannot rest until we learn more and more and do something that the world may record. Thanking you,

I conclude,

S. Sridhar.

List of Prize Winners

1. Essay:—
 - I. S. Sridhar. ... Naval High School, Cochin,
 - II. P. J. Thampi. ... Govt. Boys' High School, Parur.
2. Extempore speech:—
 - I. D. Narayanankutty. ... Naval High School, Cochin.
 - II. M. A. Yousuff. ... Govt. High School, Alwaye.
3. Science Quiz:—
 - I. Dakshayani. K. ... Govt. Girls' High School, Parur.
 - II. Lakshmi. R. ... Govt. Girls' H. S. Parur.
4. Charts:—
 - (i) Physics:
 - I. Jacob. C. V. ... Govt. High School, Alwaye.
 - II. Salim Kumar. K. ... B. H. S. Kaladi.

(ii) Chemistry:—

- I. Kamaladevi. R. ... Govt. Girls' H. S. Parur.
M. P. T. Rajappan Pillai Govt. H. S. Alwaye.

(iii) Biology:—

- I. E. K. Vijayalakshmi. St. Teresa's Convent Girls'
High School, Ernakulam.
II. P. Kumaran. ... B. H. S. Kaladi.

5. Albums:—

- I. S. Valsa Mathew. ... St. Teresa's Convent Girls'
High School, Ernakulam.
II. K. R. Mallika. ... St. Mary's Convent High
School, Ollur.

6. Manuscript Magazine: ... Science Club.
C. N. N. (Boys) High School,
Cherpu.

7. Models:—

(i) Physics.

- I. Episcopo. ... 1. K. Bhaskara Panikkar,
Govt. Boys' H. S. Parur.
2. Jacob Verghese & P. C.
Chacko, Asram High
School, Perumbavoor.

- II. Telegraph. ... Salimkumar. K.
B. H. S. Kaladi.

- III. Automatic switching. M. Radhakrishnan.
B. H. S. Kaladi.

(ii) Biology:—

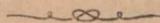
- I. Working of Lungs ... Pankajakshan Nair. N.
B. H. S. Parur

- II Articles made of shells. Sumangala. S.
St. Teresa's Convent Girls
High School,
Ernakulam.

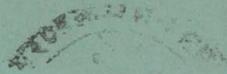
8. Collections:—
- (i) Preservation:
- I. Sasidharan. K. ... Govt. B. H. S. Parur.
- II. Chandran. T. S. ... B. H. S. Kaladi.
- (ii) Insects:—
- I. E. Thankam ... St. Mary's Convent High School, Ollur.
- (iii) Biological collections:
- I. Valsalakumari M. ... St Teresa's Convent Girls' High School, Ernakulam.
9. Experiments:—
- (i) Physics:-
- I. Water girl- ... Naval High School, Cochin.
John Chakola:
- II. (1) Dancing Doll- ... Naval High School, Cochin.
D Narayanamoorthy
- (2) Dancing Duck- ... St. Teresa's Convent Girls' High School, Ernakulam.
Elizabeth Cherian
- (ii) Chemistry:
- I. Magic pen-
Skaria, T. V. ... Govt. B. H. S, Parur.
- II. Pharoah's serpent- ... St. Mary's High School, Ollur.
M. K. Subhadra
10. Models by groups:
- I. Rocket model- ... Naval High School, Cochin.
S. Sreedhar
- II. Magic box- ... Naval High School Cochin.
T. C. Vinodkumar

List of Teachers who participated in the Science Fair.

- | | | |
|-----|-------------------------------|--|
| 1. | Sri. T. K. Gangadharan Nair | Govt. Boys' H. S. Parur. |
| 2. | „ N. Viswantha Iyer | ... -do- |
| 3. | „ K. Gopalakrishnan | ... -do- |
| 4. | Sry. P. Sarada Amma | Govt. Girls' H. S. Parur. |
| 5. | „ R. Lily | ... -do- |
| 6. | Sri. M. S. Valsan | ... -do- |
| 7. | „ N. K. Mathai | ... -do- |
| 8. | Sri. V. A. N. Bhat | B. H. S. Kaladi. |
| 9. | „ E. K. Louis | ... -do- |
| 10. | Sry. R. Rajamma | ... -do- |
| 11. | „ B. Sarojini Amma | ... -do- |
| 12. | Sri. K. Sankara Pillai | ... -do- |
| 13. | „ V. Sankaran | ... -do- |
| 14. | Sry. T. M. Parukutty Warisyar | -do- |
| 15. | Sri. K. Gangadharan Nair | Govt. High School, Alwaye |
| 16. | Sry. K. M. Mary | ... -do- |
| 17. | „ B. Sarojini Amma | ... -do- |
| 18. | „ Mariyamma T. S. | ... -do- |
| 19. | Sri. Jose Paul | ... -do- |
| 20. | „ V. M. Poullose | ... -do- |
| 21. | Sr. Maria Terozine | St. Mary's High School, Ollur |
| 22. | „ Teresa Paul | ... -do- |
| 23. | Sry. M. Devi | ... -do- |
| 24. | Sr. Leoni | St. Teresa's Convent Girls' H. S. Ernakulam. |
| 25. | „ Leonette. | ... -do- |
| 26. | Miss. Leelamma Joseph | ... -do- |
| 27. | „ P. E. Achamma | ... -do- |
| 28. | Sri. T. A. Antony | C. N. N. Boys' H. S. Cherpu |
| 29. | „ Thomas Joseph | Asram High School, Perumbavoor |
| 30. | „ A. C. D' Almeida | Naval High School, Cochin. |



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