

SCIENCE & TECHNOLOGY

HEALTH

# Genetic twin to become operational

By Kulamarva Balakrishna,  
from Vienna

THE Unido sponsored International Centre for Genetic Engineering and Biotechnology (ICGEB) will commence functioning from the first of October this year.

The thirty six member preparatory committee on the establishment of the ICGEB, which met here in June under the chairmanship of ambassador Adolfo Raul Taylhardat of Venezuela has appointed professor Irwin Gunsalus of the Roger Adams Laboratory, University of Illinois to head the centre as Director.

Prof. Gunsalus on his turn has recommended Prof. Arturo Falaschi, Director, for the Institute for Genetics, CNR, Pavia, Italy to head the Trieste component of the centre. His recommendation on his choice as head of the New Delhi component of the centre is expected to be made when the Director nominee concludes his week long India tour later this month. The Panel of Distinguished Scientific Advisers, which met in New York in May had endorsed three names for consideration. These are, Mr. Inder Verma, Mr. D.P.S. Varma, and Mr. H.K. Das. Although Prof. Gunsalus has before him the track record of the three Indian scientists, he felt it would be better to meet the candidates personally for taking a decision.

Prof. Gunsalus himself was chosen on two major considerations to head the centre. The first and foremost is that Prof. Gunsalus is very highly respected by the scientific community. Ever since he started on the career as an assistant instructor of Bacteriology at the Cornell University in 1935 with a Bachelor's degree in science, Prof. Gunsalus has gone up the ladder by publishing over 400 distinguished scientific studies on his area of research interests. These included molecular architecture of heme oxygenase proteins, intermediate states and reaction dynamics in the cytochrome p450 reaction centres,

domains of redox/effector p450 complexes. Gene structure and expression in the large, 100-200 Kb, metabolic plasmids; the fertility, chromosome mobilization, transfer, expression and specificity. The function of Vitamin B<sub>6</sub>, pyridoxal phosphate structure and amino acid reactions — transaminations, deamination, decarboxylation, and glycine-serine. Lipoic acid the pyruvate oxidation factor, structure and activities; the multienzyme desulfide redox energy transfer cycle in keto acid oxidation. A wide area that covers a lot in biochemistry.



Dr. Gangadhar Gauri

The second consideration that weighed in favour of the selection of Prof. Gunsalus in the preparatory committee was its assessment that Prof. Gunsalus would be able to inspire confidence among the business and industry, to entrust the centre with many research and development projects. In other words the committee felt that with him as head of the centre, there would be no problem for funds.

36 country members parties to the centre only Italy, Spain and Greece form a loose link to the developed western world. From the socialist bloc only Bulgaria has joined the centre. China is a member. Although Cuba is a member, it is considered part of the Group of 77. In fact, during the last years of his stewardship of Unido, Executive Director Abd-el Rahamn Khane had to find resources for the centre's promotional efforts at his personal responsibility. This was not liked by many particularly in the Western group. There were times when the Western group used its influence to discourage and disrupt the founding of the centre. If that phase is now over, the credit for this should go to Dr. Gangadhar Gauri, the then Director of Industrial Studies, who was also responsible for evolving Unido's technology transfer programme. It is the solid backing Dr. Gauri got from the scientific community during the initial stages of promotional work as well as in the final stages of shaping the centre that finally persuaded the United States send a state department official as observer to the last preparatory committee meeting. This may turn out to be the first US step before finally joining the centre.

Austria and Norway had also their observers at the meeting. But the US representation at the observer level has a special significance because it shows the US administration's awareness that the US laboratories are not the ultimate of the ideal conditions that scientific community seeks. Besides, it is also indicative of the changing structure of the scientific community itself. For example, in the field of genetic engineering and biotechnology, many who worked in the American laboratories appeared to feel the advancement of knowledge brought about by them could be made to help larger part of the humanity. This is because a good number of the new generation of scientists working in the American laboratories came from many developing

al Research Council of Canada, who initiated the idea of ICGEB.

Dr. Narang was one of about ten geneticists and genetic engineers participating in a consultations session on the implications of advances in genetic engineering for developing countries organized jointly by the Unido, International Federation of Institutes for Advanced Study and the Club de Geneve at Vienna in February 1981. Among other participants were, Dr. Herbert W. Boyer of the University of California, Dr. Anand Chakrabarty of the University of Chicago, Prof. Karl Heden of Sweden, Dr. Taniguchi of the Tokyo Cancer Institute, China born geneticist Dr. Ray Wu of the Cornell University and Dr. O. Siddiqi of the Tata Institute of Fundamental Research.

Presenting a paper at the gathering Dr. Narang said: "The techniques of genetic engineering seem to offer nearly unlimited opportunity to provide inexpensive solutions some of the humanity's most pressing problems: disease and the growing shortages of food and energy". He then listed a number of areas where research was in progress and said: "Many developing countries will need both financial and technical foreign aid to establish up-to-date laboratories to support their research efforts".

Dr. Narang went on: "But the primary problem is to train people to conduct that research. To effect an orderly and systematic transfer of technology from the developed to the developing countries, an international research training centre should be established under the auspices of the United Nations." Dr. Narang then spelt out what he felt would be the purposes of the facility. These were 1. to help each developing country establish its own core of trained professionals responsible for educating their own community and upgrading and managing their own research facilities, 2. to assist developing countries to solve particular problems of applying genetic engineering and 3. to conduct basic research into the

Dr. Narang then pointed out the dangers "of non-proliferation of technology". He said without international co-operation "it is possible that the entire technology and its benefits could be withheld from the developing countries". This could result, he added, from "collective oversight or incompetence of international leaders. Dr. Narang said: "An analogous situation already exists to control the spread of nuclear technology and is codified in the Nuclear Non-proliferation Treaty.

..... The difference between nuclear and recombinant DNA technologies is that an international non-

the implications of access to knowledge the experience of other scientists are no very different. I remember United Nations Children's Fund (UNICEF) Executive Director carrying in his pocket packets of inexpensive doses of medicines that could save the lives of children and exhorting the peoples and governments make use of them. The question of commercial ownership of patents and other legal implications serving as impediments to the welfare of humanity is very much understood by most of the scientists whether they came from developing countries or from advanced ones.

The Unido sponsored consulta-

tries to the idea of such a centre, its scope and functions, the needs it could meet and especially the support it could give to national efforts.

The mission was headed by Prof. Carl Goran Beden of Sweden. Its members were: Prof. Boyer, Prof. A. Bukhari of Cold Spring Harbor Laboratory, Prof. A. Chakravarty, Prof. Narang, and Prof. Ray Wu. From the Unido side, led by Dr. Gauri, Mr. K. Venkataraman, Mr. Wafa Kamel, E. Yakushin and J. Cramwinckel gave support to the mission. The mission visited Mexico, India, Argentina, Brazil, USA, Tanzania, Egypt, Saudi Arabia, Kuwait, Philippines, China, Ireland, France, Federal Republic of Germany, the Soviet Union and Italy. Its report felt that it would be desirable to work for an international centre for genetic engineering and biotechnology.

Then a select committee of scientists were appointed to visit the various countries offering to site the centre and report. The committee's report led to discussions if it would not be desirable to have the centre in more than one location. At the same time, the Unido support team have been piecing bits and pieces together evolving the conceptual structure of the centre for the consideration of the scientists and member governments. An agreement on the establishment of the centre was signed, at Madrid in November 1983. The location of the centre remained a controversial issue for some time but it was overcome by the proposal to develop it as one single unit with two components. Early in 1985 New Delhi and Trieste were elected to be the sites of research on human health and agricultural areas were allotted as the field of work at the New Delhi component while the industrial application of biotechnology would be the area of work at Trieste.

The first five years of the expenses of the centre are to be covered by the donations made by host countries India and Italy. An interim preparatory committee will

adopted and it would be implemented once Prof. Gunsalus takes over. The interim programme covers a period of three years beginning with October 1986 and ending by September 1989. The appointment of the heads of components, the recruitment of the scientific personnel and other staff members and related work would begin immediately.

In the last year's budget in India a provision for 60 million rupees for the Delhi component was made. Because of the delay in the appointment of the Director, the funds remained unutilized. Mr. S. Ramachandran, Secretary, Department of Science and Technology told the Economic times, fresh allocation of funds had been made and the work on the construction of provisional facilities for the ICGEB was in progress in the premises of the National Institute of Immunology. The structure is expected to be ready by the end of October.

Meanwhile, two laboratories in the School of Life Sciences at the Jawaharalal Nehru University were being remodelled as part of provisional facilities. Similarly Italy has reported the availability of ready infrastructure. The panel of scientific will meet again in November and during the first week of December the preparatory committee is set to review the progress of the centre after a hearing a report from the Director. The next meeting of the preparatory committee, if all the legal procedures go according to plan would be the last session of the committee, since by then the centre would have been established with a board of governors. In the interim, Unido will administer a trust fund for the ICGEB. Prof. Gunsalus, who would hold the rank of the UN. Assistant Secretary General and draw a similar emolument, has besides organizing the centre itself, will have to decide on a date for pledging conference of by member countries. He may also have to identify potential collaborators in the centres research projects by financing them and of course will have to decide on his



Scientists participating at the first consultation on establishing ICGEB at Vienna

proliferation agreement would withhold the benefits as well as the risks. On the one hand the gap between the standards of living in the developed and developing countries could be magnified tremendously. On the other hand, the potential for international coercion and manipulation in such a situation demands careful consideration"

It may be pertinent to point out that Dr. Narang worked as an associate with Dr. Hargobind Khor-

actions itself was a kind of follow up action thought out by Dr. Gauri to the United Nations Conference on Science and Technology for Development held in Vienna in 1979. The conference had aimed at organizing a technology transfer mechanism. It also had identified half a dozens of emerging technologies having significant impact on longer term development problems. Genetic engineering was one of the six and the participants in the consultations felt that it might be a good

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ART

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THEATRE

## Renaissance in arts

By Shakuntala Balu

ART is very much in the life of Karnataka and part of it. It is often in the news with a spate of colourful exhibitions held from time to time in the capital city of the state as well as in its districts.

There have also been special happenings like the mobile art gallery sponsored by the state Lalit Kala Akademy. The mobile art van is slated to tour the remotest corners of the state, and create greater art awareness. To crown it all, Bangalore too, for the first time, has an arts college affiliated to the Bangalore University, with a full-fledged course to award Bachelor of Fine Arts degree to students, who complete the five year degree course successfully.

Does all this spurt of activity mean that art in Karnataka is riding on a high crescent? Has it received the necessary patronage from government and others? And above all, are artists happy about the art scene in Karnataka? I talked to some well-known artists and veterans who have dedicated their entire life to art.

Eminent Russian Artist Dr. Svetoslav Roerich, who has settled down in India and spends most of his time in Bangalore, is connected with the fastly growing Chitrakala Parishat. He feels there is a great future for art in Karnataka — a state which has been exhibiting progressive growth in several spheres.

"Art moves in waves... In Karnataka, we shall have one day a great renaissance in arts. This is definite. It is not important when it will happen, but the fact remains that it will," says Dr Roerich and adds, "Karnataka now occupies an important place in the mosaic of India. One development leads to another. Art needs patronage and certain conditions to express itself. That conducive climate is present in Karnataka to make artistic expressions bloom. Art is an integral part of a developing society. There has been creative endeavour at all times. No

one can ever forget the greatness and the uniqueness of the Hoysala art. The Maharajas of Mysore State were great patrons of art. Today, the full cultural machinery has not yet developed in Karnataka, like in the olden days under the Maharajas. But there is awakening or strong awareness amongst the peo-

ple speak for him. "Every stroke of the artist expresses the power of energy hidden in thought." That was what Rembrandt told well-known German scientist Leibnitz in the 17th century. It has been recorded by Leibnitz in his diary that every stroke, every line on the canvas contains the expression

work of the people even in the remote areas, which is a very precious heritage, that should be nurtured with care. The village people are nearer to earth, to nature, and their work reveals the spontaneous beauty of nature or portrays the great heroes of epics, heroes they greatly revere and consider as models. Thus, their work reflects beauty and a positive approach. It never portrays frustration or conveys any negative feelings. That is what we should appreciate in rural crafts, qualities that every one should emulate to attain the qualities of perfection in life. Art should make us transcend the mundane and help in the pursuit of perfection.

Art should elevate mankind and lead, as Plato says, from "beautiful images to beautiful thoughts, from beautiful thoughts to a beautiful life and from a beautiful life to absolute beauty."

Dr. Roerich is the chairman of the Board of studies of Chitrakala Parishat's college of Art, which has Mr. M.S. Nanjunda Rao as secretary. Ms. Kamalakshi, one of trustees, and member of the faculty, explained the syllabus which has been planned on the lines of well-known art colleges in the country. Mr. Nanjunda Rao, who is also a member of the Central Lalit Kala Akademi has been mainly responsible for the growth of the Chitrakala Parishat Art Complex, and for the Chitrakala Vidhyalaya flowering into a full-fledged college, over a span of 25 years. "When I wanted to study for a degree in Fine Arts, there was no possibility in Banalore. Everyone could not get a chance to join J.J. School of Arts. I had to take my B.Sc. degree, and side by side study art and qualify for a diploma. Today the students are lucky to have a degree course open to them in a Bangalore college, affiliated to the Bangalore University. One hopes they will realise their luck and the hard work put in by the people connected with the Parishat to make this dream of art education possible for Bangalore," says Ms.

Kamalakshi.

The Ken School of Art, run by artist R.M. Hadpad in Seshadripuram is a landmark in Bangalore's art scenario. Dedicated and committed to art as a way of life, Mr. Hadpad, a J.J. School of art student, was part of the first group "We four" that held an exhibition of modern art in the city way back in 1966.

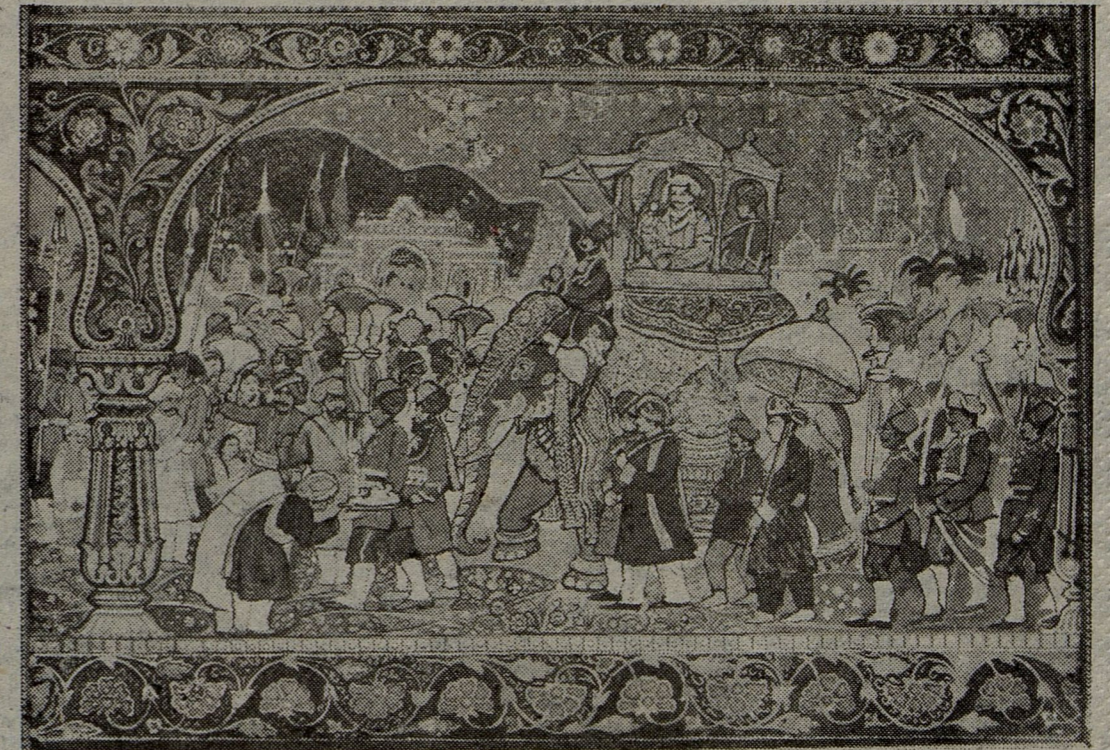
### Hobby classes

Mr. Hadpad trains students for the G.D. Arts Diploma, and also runs hobby classes in art for those who are keen to study art and art appreciation. Along with art teachers and artists like S. Dhana-lakshmi, R. Umesh, Mani and others, he has created a high reputation for this art school, which caters to interests in several art media.

Mr. Hadpad feels that there should be more equitable distribution of grants and aids to art institutions in the State. The Government has many good plans but proper execution of these plans and their well-intentioned schemes alone can help the progress of art and artists. He feels Committees should be more broad based with eminent art personalities from the State and outside for impartial allocation of funds.

He is keen on exposing as many people as possible to art, even if it be for a short period, to awaken inherent artistic tendencies in people. "Art should be for all round improvement or people, to provide an added dimension to life." Mr. Hadpad feels that in general, people have become immune to the art scene and artists. Though it has become a fashion to hold exhibitions there has to be a conscious effort to improve the taste of people through art education, through the media, through inexpensive, subsidised booklets, more museums. To elevate the people the artist should learn not only to work for fame and money but also for creativity, inner growth and satisfaction.

Another Karnataka artist who has



A traditional painting by V. Subramanya Raju

dedicated his entire life and property for the promotion of art through postal courses is Mr. M.T.V. Acharya. His aim has been to make it possible for a large number of art lovers to learn to draw and paint even in a home milieu. Often people who want to learn do not get the facilities to learn in their places. So, he formulated the postal course, and set in it motion in 1969, with help from his wife Vijayalakshmi.

Mr. Acharya feels such correspondence courses should be recognised by the government and the university, like other arts courses, to enable students completing the course to get jobs, or to give them the feeling of securing as a progressive step in art education. He recently obtained recognition for this course from the state Lalit Kala Akademy but would like government recognition too.

Besides these institutions, there are several art institutions in various parts of the state, like the CAVA or the Chamarajendra Academy of

Visual Arts (the former C.I.T.), the Government School of Arts and Crafts (Davanagere), Government School of Fine Arts (Dharwad), Kalamandira (Bangalore) and others to promote art education.

One however gets the feeling that the standard of art education needs to be given greater fillip and made more broad-based not only to provide training to students but to help them become creative in every sense of the term and achieve the greatest expression. The department of education and the State Lalit Kala Akademy could introduce more innovative schemes to help in this objective.

The state has several eminent who have made a mark on the art scene even internationally. A case in point is the young artist Pushpamala Rao who bagged the Triennale Award. Balan Nambiar has made a mark with his huge metal sculptures and done considerable research work on Bhutas and

Feiyams under a Nehru Fellowship. Veteran artists like Sri Inamathi, who is in his seventies, have the same dynamic involvement in art. Another senior artist, Sri Y. Subramanya Raju, who is a great master in the school of Traditional Paintings of Karnataka was recently awarded a senior Emeritus fellowship by the Ministry of Human Resources Development. Several artists have rendered yeoman service to art and art development in Karnataka, but space limitations preclude individual mention.

In Karnataka, both the traditional and modern styles of art flourish side by side. Gold leaf and gesso work are learnt or appreciated with equal zeal as graphics and prints.

Both the people and artists have grown and progressed with an open mind and a healthy approach to art, imbibing the best from the traditional and the modern, giving an Indian flavour to the art stemming from Karnataka that is at once contemporary in design and universal in appeal.



Dr. Svetaslov Roerich at an art exhibition in Bangalore

ple to embellish their lives."

### Positive attitude

Dr. Roerich feels strongly that an artist should have a positive attitude towards his work and life. He should never feel that he is dependent on patronage. He should create good works of art, which will ultimately

of thoughts. Thus, the emotions of Rembrandt are preserved in his compositions. And these are released to those who can attune themselves to the paintings.

Dr. Roerich also pointed out that there is wonderful, inherent talent in Karnataka among the simple artisans, who work in clay, stone or wood. There is refinement in the