

# Report on Motion Picture and Television Technology in the USSR

By ROBERT M. SMITH

During the SMPTE Conference in Los Angeles (21-26 October 1979), the USSR delegation extended an invitation to SMPTE President Robert M. Smith and his wife, Edna, to visit the Soviet Union during the 1980 Telekinotechnika Exposition and Technical Conference scheduled to be held in Moscow 28 February - 12 March 1980. The year 1980 also marks the 60th anniversary of the motion picture industry in the USSR (1920 - 1980). Shortly thereafter, a formal invitation was received by the Society from Dr. Oleg I. Ioshin, a Fellow of the SMPTE and Deputy Chairman of the USSR State Committee for Cinematography. The invitation was accepted, and the following is President Smith's account of his and his wife's experiences and observations during their visit to the Soviet Union.

When we arrived in the Soviet Union we were met by our host, Dr. Ioshin, Dr. Solomon A. Bongard, Deputy Director of Cinema and Photo Research Institute (NIKFI), Dr. Vladimir L. Trusko, a Fellow of the SMPTE and Technical Director of NIKFI, and Mrs. Maia Kvasha (NIKFI), who served as our technical translator.

On our arrival it became very obvious that our Society continued to be held in the highest esteem by the motion picture and television industries in the USSR.

## Technical Exhibits

The first days in Moscow were spent at the Technical Exhibits (Fig. 1) with a full day being spent at the USSR Pavilion where we were shown motion picture and television equipment manufactured in the USSR. A detailed explanation of the equipment was given to us by our guides (Fig. 2).

The Pavilion contained exhibits of over 700 related pieces of industrial equipment with very heavy emphasis on 16-, 35-, and 70-mm projection equipment (Figs. 3 and 4) as well as the latest Soviet-manufactured motion picture cameras; also shown were all types of professional motion picture equipment including cameras, lighting, sound, and laboratory equipment as well as portable production equipment for both the motion picture and television industries.

On the second day we attended the tech-

nical lectures, which were given in three simultaneous language translations including English. The presentations were given by engineers and scientists and also by some of the exhibitors who came from the United States, England, West Germany, Japan, and other countries as well as the Soviet Union.

We attended programs where papers on optical stereo sound for both 16- and 35-mm motion picture projection, camera lighting, and filter techniques were given; also a session on a time code motion picture editing system which received a lot of attention. Many questions were asked by members of the audience. The papers given at the various sessions were mostly authored by Soviet technicians and engineers and most of the papers were presented by women (Fig. 5).

On the third day we attended the foreign exhibit area in another Pavilion where over 200 different firms from 17 countries exhibited motion picture and television equipment (Fig. 6). We recognized many of the exhibitors who had previously exhibited at our own SMPTE conferences. We were told that on some days as many as 18,000 persons viewed the exhibits.

## Itinerary

Our hosts then arranged an itinerary which would give us a chance to see other motion picture and television facilities not

only in Moscow but in other major cities in the USSR. It was known to our hosts that we had recently returned from the Winter Olympics at Lake Placid so the new television broadcast center designed for their upcoming Summer Olympics was the first stop on the itinerary. Next was the City of Leningrad, then Kiev, and then our return to Moscow for further tours of laboratories, research centers, and studios.

At a reception held to open the exhibit and conference, I had the opportunity of meeting the Deputy Mayor of the City of Moscow; the Vice-Chairman of the USSR State Committee for Television and Radio Broadcasting, Henrikas Jushkevitchus; and many other USSR members of our Society. Also present were Harry Teitelbaum, the SMPTE Conference Vice-President and an exhibitor at the USSR conference, and Mrs. Teitelbaum.

A personal invitation was extended to Edna, myself, and the Teitelbaums to visit both the present television and radio broadcast center and also a new facility nearing completion. A full day was spent at the television center (Fig. 7) which is designed to handle all of the remote television feeds as well as the direct coverage for the Summer Olympics. This facility will have 33 studios assigned to the organizations and countries providing the Olympic coverage.

At a luncheon hosted by Dr. Henrikas Jushkevitchus we engaged in an open and frank discussion concerning the international ramifications centering around the Summer Olympics. Present at the luncheon, in addition to Edna and myself, were the Teitelbaums, Dr. Ioshin, Dr. Bongard, our interpreters, and the international protocol personnel.

A number of in-depth discussions took place at this luncheon and a number of il-



Fig. 1. The television exhibit at the Telekinotechnika Exhibition in Moscow.



Fig. 2. SMPTE President Robert M. Smith discussing the fine points of cinematography with a motion picture camera technician at the Telekinotechnika Exhibition.

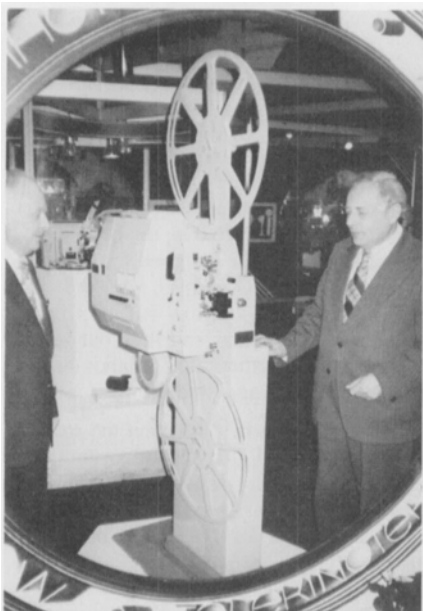


Fig. 3. Dr. Solomon A. Bongard (right) explaining the technical details of a Russian-made projector at the Telekinotechnika Exhibition.

luminating observations were made by our host, Dr. Jushkevitchus, who had recently been interviewed by Dan Rather on CBS's *60 Minutes*. During the interview, the Olympics boycott had been discussed with reference to the effect of the boycott on the many plans and preparations that had been made in the USSR and throughout the world in anticipation of the Summer Olympics in Moscow. However, the main subject of discussion at the luncheon was the need for standardization of television equipment with special reference to the new digital technology.

Dr. Jushkevitchus, who has close business relationships with many members of the SMPTE, spoke strongly about the vital need for international standardization, calling on the SMPTE to help in attaining the goal of international standardization in the new technology thus avoiding the restrictions on the interchangeability of equipment which, in the past, have been detrimental to the television industry. Although most of the discussion at the luncheon centered around standardization, Dr. Jushkevitchus, a man of unusual presence and conversational ability, touched on a



Fig. 5. A scientist presenting a paper on Studio Lighting at Telekinotechnika.



Fig. 4. Robert Smith studying the unusual features of a projector at the Telekinotechnika Exhibition. At his left is Maia Kvasha, the interpreter.

number of topics, which brought on a lively discussion, with various opinions being expressed.

#### City of Leningrad

On the day following the luncheon we left for the City of Leningrad with a new technical translator, Mrs. Rimma Grigoryants. The City of Leningrad truly deserves its reputation of being one of the most beautiful and interesting cities in the world.

Our first visit in this city was to the famous Lenfilm Studios (Fig. 8), where we were given a complete tour of the facilities by the studio director, Mr. Vitaly P. Provotorov. Following the tour all the technical department heads met with us to discuss new trends in motion picture and television production as well as in labora-

tory technology. This studio is presently making some 50 feature films a year including 35- and 70-mm films for theatrical distribution and 35-mm films for television. Following the tour we were invited to the famous Leningrad Institute of Motion Picture Engineers (Figs. 9-13). This tour was conducted by department heads under the direction of Dr. Mavr V. Antipin, Rector of the Institute. This college was established before 1920 and is considered the most important institute of photographic education in the Soviet Union. At present more than 3500 students are enrolled and most of the leading individuals connected with the motion picture industry of the Soviet Union are graduates of this institute, including Dr. Ioshin and Dr. Trusko. The curriculum leads to an electrical, mechanical, and chemical degree and is a four-year program. The Institute is expanding and we had the opportunity of visiting classes, lectures, laboratories, and equipment training areas in both the present facility and a new complex which is nearing completion in a different area of Leningrad. We learned that representatives of many foreign countries visit the Institute to study the curriculum and faculty selection procedures. The students are greatly in demand throughout the Soviet Union after graduation as directors, producers, screenwriters, and critics as well as technicians and engineers. One very interesting bit of information was that every piece of equipment used in the motion picture and television industries is available for the student to use during his or her training. I saw over 40 different types of projection equipment with which the student can familiarize himself and this is also true for motion picture and television cameras.

The director pointed out that the members of the faculty are selected from those individuals who have proven themselves in their given area of work; they are not trained merely to become educators but they are engineers who have shown a special interest in education. Over 60% of

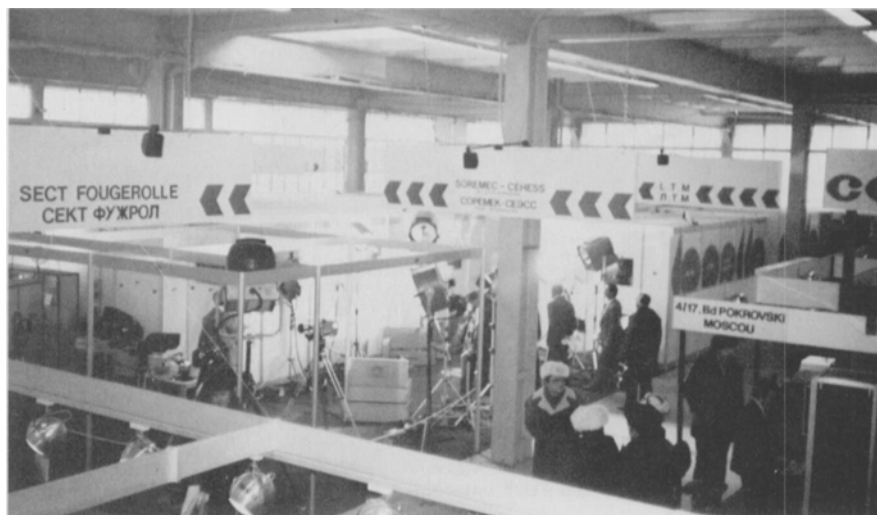
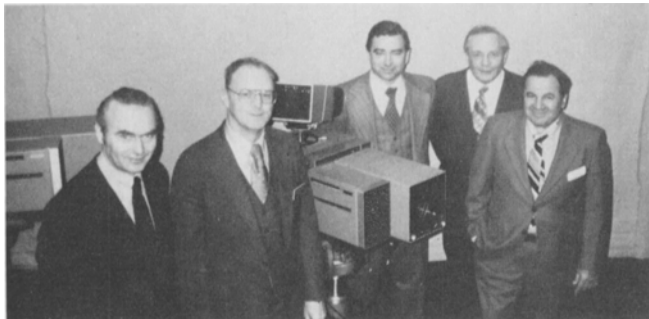


Fig. 6. Foreign exhibit area at the Telekinotechnika Exhibition.



**Fig. 7. Dignitaries assembled at the Central Broadcast Center: Oleg I. Ioshin, Deputy Chairman of the State Committee of the USSR for Cinematography; Robert Smith; Henrikas Jushkevitchus, Vice-Chairman, USSR State Committee for Television and Radio Broadcasting; Solomon A. Bongard, Deputy Director, Cinema and Photo research Institute (NIKFI); and Harry Teitelbaum, SMPTE Conference Vice-President.**



**Fig. 8. We toured the Lenfilm Studios with Michael Swiridov, Vitaly P. Provotorov, Director, and Nikolai P. Slokatovich.**

these individuals have doctorates in science and prior experience in the field before being selected as teachers. The faculty members who teach language, physics, and chemistry are all graduates from other technical institutions specializing in their particular areas of expertise.

Members of the faculty were eager to hear about the new technology, especially about computers, microprocessors, and 16-mm as well as ENG and smaller video formats. A long and detailed discussion was held with the faculty department heads with a very free exchange of ideas and information.

One cannot leave the City of Leningrad without feeling strongly that the people of this city hold a special place of honor. It only takes a visit to the Memorial Cemetery where 2.5 million citizens are buried in a mass grave to give understanding to even the most insensitive individuals of the people's great concern as they express their hope for peace and understanding between nations. This message was expressed throughout our entire visit but even more strongly and meaningfully in the beautiful City of Leningrad so fearfully besieged for 900 days in World War II.

The next city on our schedule was the City of Kiev, located in the Ukraine Republic of the Soviet Union (Fig. 14). The famous Dovzhenko Film Studios are in this city. Our host was the Technical Director, Dr. Vladimir Kovalenko (Fig. 15) who in his person exemplifies the spirit and purpose implicit in this studio. It is known as one of the most technically oriented studios in the USSR and has the mark of quality on all of its productions. It is also known for its young and talented personnel.

Everyone we met who was involved with this studio was quite young, very enthusiastic, and dedicated to enhancing its reputation. The studio, which has over 2000 employees, has received the highest award in the Soviet Union — the Order of Lenin — which was given in recognition of 50 years of high quality performance and for filming over 600 feature productions during this time. At present the production schedule calls for 30 films in 1980 with 18 feature films being made for television and 12 for distribution. Many of the award-winning films produced in the USSR are made in this studio (Fig. 16). Included in the staff are over 150 actors and actresses who are used on a continuous basis in the studio's productions. They also conduct a

theater in the City of Kiev where they perform before live audiences. The feeling is that acting before live audiences makes for well-rounded performances in motion picture productions.

The Dovzhenko Film Studios are presently involved in co-producing with Yugoslavia, Poland, Czechoslovakia, and Rumania, and have cooperated with American film studios. Also of importance are the training programs for directors, actors, actresses, stage designers, costumers, and writers. The emphasis is on youth and total commitment and dedication to filmmaking.

#### Return to Moscow

Upon returning to Moscow a full schedule of visits to motion picture facilities was set up. The largest studio in the Soviet Union is Mosfilm. This facility has over 5000 employees and is by far the largest studio complex in the Soviet Union. Professor B. M. Konoplev, Technical Director, Gregory Hazanov, Head of the Technical Department, and Dr. Michael Z. Wysotsky, Deputy Technical Director, conducted the tour of the facility. Dr. Wysotsky has been a member of the SMPTE since 1941 and was made a Fellow of the Society in 1972.



**Fig. 9. At the Leningrad Institute of Motion Picture Engineers, clockwise at the table are Michael Swiridov; Stepan S. Savitchev, Prorektor; Mavr V. Antipin, Rector of the Institute; Rimma Gri-goryants, Interpreter; and Robert Smith.**



**Fig. 10. At the Institute of Motion Picture Engineers, Stepan Savitchev, Robert Smith, and Mavr V. Antipin.**

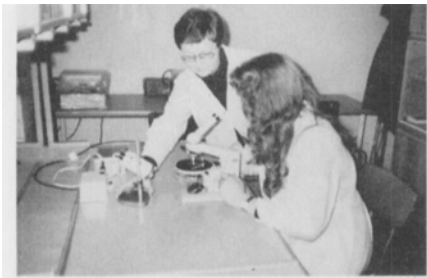


Fig. 11. Students at the Leningrad Institute of Motion Picture Engineers.



Fig. 12. A chemistry class at the Institute of Motion Picture Engineers.



Fig. 13. Audio students at the Institute.

The studio was established in 1927 and, at present, contains 13 very large sound stages, sound recording studios, and a motion picture processing laboratory. A new facility is under construction and 50 feature films are scheduled for production in 1980.

While there we visited the set where they were shooting scenes for what, we were told, would be the most important film produced this year — *Tehran* (Fig. 17). The film is based on an assassination attempt planned to occur during one of the Big Three meetings between Churchill, Roosevelt, and Stalin that took place during World War II — an attempt that was narrowly averted. Part of this feature film was later shot in the United States with the same camera crew and directors.

Following the tour we met with Vsevolod A. Bisikalov who has the responsibility for print distribution in the Soviet Union. He is General Director of Kopirfilm of Goskino. When a feature film receives wide distribution within the Soviet Union it is not uncommon for the feature print requirement to reach 1400 35-mm and 70-mm release prints. It is very expensive to have this amount released under the present silver-based photographic technology.

Mr. Bisikalov told us that it is quite common that release prints must be ready for distribution within 15 days after the release printing negatives are delivered to the laboratories. He expressed keen interest in the development of nonsilver technology, new print treatment procedures designed to prolong the life of a given film, and the use of 16 mm for smaller screens. We engaged in long discussions on trends in the use of faster printing and developing machines to increase productivity.

He informed us that many of the 70-mm feature films are photographed in that format, while others are blown up from 35 mm to 70 mm. Approximately 850 cinemas are equipped with 70-mm projection. A total of 240 feature films were distributed in 1979. There are approximately 165,000 theaters with 35-mm and 70-mm motion picture screens plus an additional 50,000 cinema clubs that use 35-mm facilities.

Mr. Bisikalov expressed his very warm and appreciative understanding of how important it is for our Society to be available on an international basis since it is so highly regarded by the Soviet film community.

## NIKFI

Next on the schedule was an all-day tour of NIKFI (the Cinema Photo Research Institute of the USSR) and meetings with the staff (Fig. 18). Our host was Dr. Aleksander V. Furduev, Director of the Institute, and we were happy and honored to meet again with Professor Victor G. Komar, a Fellow of the SMPTE, who is Director of Science at the Research Institute. I also had the opportunity of renewing a relationship with Dr. Leonid V. Scheetov of the Electrical Acoustics Laboratory with whom I had had the pleasure of working closely at the last ISO/TC 36 meeting in Belgium. During the tour we were joined by Professor L. Artyushin who is in charge of Technical Science at NIKFI.

NIKFI was founded over 50 years ago and has the responsibility of all scientific research related to the motion picture industry (with the exception of film emulsion technology) including electronics, chemistry, acoustics, lighting, color reproduction, and optical and camera design — all scientific and technical procedures relating to the motion picture industry. This facility has over 143 different laboratories working on all phases of motion picture technology. We had the opportunity of viewing some of the projects under study, including three-dimensional photography; hologram motion pictures — under the direction of Prof. Komar; research on chemical pollution control; design of all types of motion picture laboratory equipment, including printing, developing, sensitometry, inspection, and editorial machines; research on new printing light sources (where we witnessed a laser being used as a printing source in a motion picture panel printer); computers and microprocessors being used for chemical and sensitometric control of release prints; and a research project on the restoration of film, both color and black-and-white. A detailed explanation was given to us by Dr. Bongard, who has the responsibility for imbibition process improvements and other nonsilver photographic technology research. Planning for theater projection was also discussed and we were told that all the major motion picture theaters in the Soviet Union are now fully automated and using platter type projection equipment.

We had the opportunity of visiting the research area headed by Prof. Komar (Fig.



Fig. 14. Arriving at the Kiev airport, Edna Smith was welcomed by (on left) Vladimir Kovalenko, Technical Director of the Dovzhenko Film Studio, who presented her with flowers, and Anatoly Polunchuck, Assistant Director of the Studio.

18) where, in 1976, the first Russian hologram film ever produced was made. A recent improvement to this early technology has been the addition of a hologram motion picture film in color.

Research in other laboratories we visited included work being done on videotape-to-film transfers using laser techniques, the development of an automatic coded editing and assembling system based on video shooting using a time code with image information being stored in memory, and research using computers for special effects. A complete feature film made by computer technology may be possible in the near future. Our hosts emphasized that this vast and complete research facility has one purpose: to improve present procedures and work on new technologies that will be helpful to the motion picture and television industry.

After our tour, a meeting was held with many of the research directors on the need for standardization of new technology so that it can be used on an international worldwide basis with the hope that standardization would do away with confusion and duplication, thus providing the possibility of better understanding between nations.

Although time did not allow us to visit them, there are research laboratories involved in work on the economics of running laboratories, studios, and other areas related to our industry. Research is being conducted on all types of automation using computers and microprocessors. There is also a department for work on standardization both within the Soviet Union and other democratic countries, as well as involvement with the International Standardization Organization and the SMPTE. Work on productivity improvement goes on apace. The researchers feel that it is not enough to have their technology adopted only by the democratic countries associated with the Soviet Union but that their standardization should be integrated on an international level.

On the last day of our visit, we were informed by our host, Dr. Ioshin, that we would have a general meeting at Goskino (Fig. 19). This meeting took place in the afternoon and Mr. Harry Teitelbaum was present. In this meeting, I was asked about my views of the motion picture and television industry in the Soviet Union and was informed that they would like to hear a frank and open critique of what I saw, and also where, in my opinion, the emphasis should be on future technology in the motion picture industry. Areas that I felt were important to the motion picture industry in the Soviet Union were: that the imbibition process technology has improved over the years and I stated that I have screened high quality prints from this process within the past six months and feel this system to be very important especially because of the high cost of silver. (Ed. Note: At that time silver was priced at 42 U.S. dollars an ounce.) Another important area where I felt



Fig. 15. The motion picture camera used by the famous director Dovzhenko (for whom the studio was named) in his earlier productions observed by Vladimir Kovalenko, Technical Director of the Dovzhenko Film Studio, and Robert Smith.

more research would be desirable is liquid gate printing. I stressed how important this is becoming in our industry. I also questioned why more 16-mm film was not used throughout the country. Again, because of the price of silver, I felt that this should be restudied because I am sure that, in many cases, 16-mm could be used given the right conditions and the right size cinemas as well as 16-mm or S16-mm to 35-mm blow-ups. An area where I was not fully knowledgeable concerned the research on 70-mm films. I questioned the need based on the cost of film using this format.

Dr. Ioshin addressed himself to my



Fig. 16. At the Dovzhenko Film Studio in Kiev, a model ship is being built for a future feature production.

points and stated that these areas were a major concern of the motion picture industry of the Soviet Union. They realize that the use of 16-mm has to be studied. Also, the highest priority is being given to the nonsilver imbibition technology for the reasons that I stated. He also agreed that liquid gate printing is important and will be given a high priority in their future research and development. Concerning 70-mm and three-dimensional photography, he said that this is widely accepted and appreciated by the audiences but there are no plans at the present time to increase the number of theaters capable of showing this format.

After certain introductory remarks in which I noted the positive things I saw during my visit, we had an open and pointed



Fig. 17. On the set of *Tehran* during the filming at Mosfilm are Co-Directors Alov and Nemaymort with Robert Smith.



**Fig. 18.** Seen here are Aleksander Furduiev, NIKFI Director; Robert Smith; Rimma Grigoryants, Interpreter; Victor G. Komar, Deputy Director, NIKFI; Solomon A. Bongard, Deputy Director, NIKFI; and L. Artyushin.



**Fig. 19.** The meeting at Goskino. Facing Robert Smith across the table are (left to right) Harry Teitelbaum, Solomon A. Bongard, Oleg Ioshin, and Vladimir L. Trusko, Head of Technical Board, USSR State Cinema Committee.

discussion on the Soviet role in standardization relative to the motion picture and television industry. Those in attendance, representing different areas of the motion picture industry of the Soviet Union, made it very clear that standardization, once adopted, is the law in their country and they find it very difficult to understand the procedure used in many countries, including the United States, where a company may or may not use the approved standard according to its desires. They expressed concern that many times the United States as well as other countries take a negative viewpoint on recommendations introduced by the Soviet Union and feel that full consideration is not given to their recommendations. They expressed a desire to work with the SMPTE on standardization efforts emphasizing that in this area as well as others the SMPTE is an important organization.

We reviewed certain areas of ISO/TC 36 activities pertaining to the Soviet Union and the United States, recognizing the fact that the SMPTE is the Secretariat of the ISO/TC 36 Committee on Cinematography. Some concern was expressed by the Soviets on the possibility of a conflict of interests. I explained that many Society members and officers have a joint responsibility toward our Society as well as serving as members of the ISO/TC 36 American delegation and also having a national responsibility to ANSI. I assured them that we are fully aware of our responsibilities and when we attend an ISO meeting we attend as members of the American delegation and not as SMPTE officers. I told them I would bring their concern to the attention of the individuals responsible for

the engineering efforts of our Society and the members of the ISO/TC 36 American delegation.

I stated that, in my belief, it was very important that the motion picture industry in the Soviet Union have representation on the standardization work within our Society and that the individuals who are selected to serve on these committees be in a position to serve on a long-range basis so their viewpoints can be considered and made part of any final standardization work by a committee.

We all agreed that standardization work is very tedious and time-consuming, but I stressed very strongly that participation in standardization work should be a long-range commitment giving individuals as well as their positions on a given issue an opportunity to become known. It was very obvious that everyone understood this to be a very serious and complex problem and it was apparent that their efforts and concerns are sincere and their technical and research people are looking for better ways to communicate and participate in evolving international standards. It was stated earlier, and again at this meeting, that a standard should be accepted on an international basis if it is to become meaningful to our industry.

#### **Social and Cultural Activities**

Throughout this report I have highlighted only the technical facilities that we encountered during our visit. It would not be complete if I did not mention the many social and cultural events planned for us during our stay. Each day we were asked

what we would like to see of a historical or cultural nature in each city and usually each night some social event was planned. We had the opportunity to see opera, ballet, folk dances, and circus performances, which have to be ranked among the best that we ever witnessed. Every possible courtesy was extended and in every city, from early morning to late at night, we were given every consideration by our hosts. Throughout our visit, we spent almost all our time with our hosts and at almost every meeting, either at laboratories, television facilities, studios, exhibits, or receptions, frank and open discussions took place pertaining to the present state of the relations between our two countries. While we differed in our approach to and understanding of our philosophy of government, I felt I had acquired an honest and firm belief that peace and understanding are important to the individuals with whom we came in contact. I was told at the start of my visit, "Mr. Smith, it is your job and mine to improve the technology of our industry and to make good films for cinema and television and not to make political policy." I believe that this philosophy was adhered to by all the technical individuals with whom we came in contact during our stay. I strongly feel that the decision we made to carry on with this visit was right and in the best interests of our industry and our Society if we are to maintain ourselves as an international Society.

On behalf of our Society, I would like to thank the motion picture and television industry of the USSR and, in particular, Dr. Ioshin, for the opportunity to visit his country which I feel can only lead to better understanding between our industries.