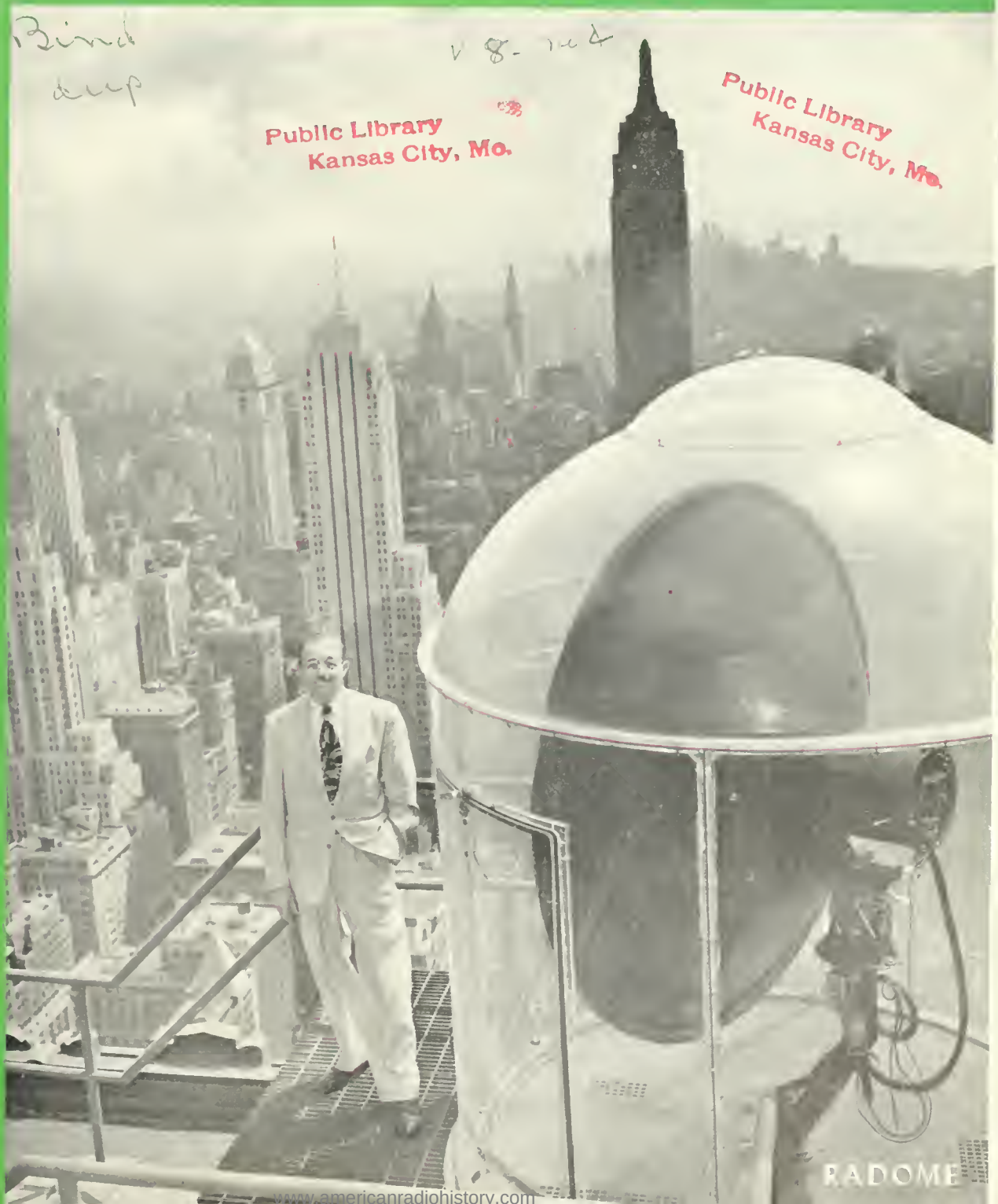
# RADIO AGE

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION






RCA

JULY

1949

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Division of Radio Corporation of America

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# RADIO AGE

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION

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VOLUME 8 NUMBER 4 July 1949

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RADIO CORPORATION OF AMERICA
RCA Building, New York 20, N. Y.

DAVID SARNOFF, *Chairman of the Board* FRANK M. FOLSOM, *President*
LEWIS MACCONNACH, *Secretary* ARTHUR B. TUTTLE, *Treasurer*

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EFFECTIVE LIGHTING ENHANCED THE DRAMA IN THIS BANQUET SCENE FROM NBC'S ALL-STAR TELECAST OF "MACBETH."

# Man and Science

*General Sarnoff Tells Medical Group "Human Race Remains in Dangerous Ignorance of Itself" — Advocates Coordination of Scientific Specialists in a "Supreme Quest", Utilizing Atomic Energy — He Proposes "Radionetics" as New Branch of Electronic Science Applied to the Human Body*

IMMEDIATE use and coordination of every new force in both the physical and social sciences to learn "what makes man tick" and to improve his well-being were urged by Brig. General David Sarnoff, Chairman of the Board of the Radio Corporation of America, in an address before the International Congress on Rheumatic Diseases at The Waldorf-Astoria, on June 1.

General Sarnoff recommended that such a project begin at once with a penetrating study of man himself, using atomic energy and radiations, electronics and all the other scientific tools now available for research and investigation. Used together, he emphasized, these should point the way to improve man's health and his physical, mental and spiritual equipment. He proposed the creation of a new branch of science—"Radionetics"—to deal with the application of electronics to the human body.

In stating his thesis, General Sarnoff based his recommendations on the premise that, despite the great advances of science and technology, the "human race remains in dangerous ignorance of itself". He charged that largely because of this ignorance, a world "that might have peace and plenty and happier and wiser inhabitants is threatened by violence, hunger, and desolation".

BRIG. GENERAL DAVID SARNOFF (RIGHT), WHO MADE THE PRINCIPAL ADDRESS AT THE BANQUET OF THE INTERNATIONAL CONGRESS ON RHEUMATIC DISEASES, CHATS WITH DR. CORNELIUS H. TREAGER, CHAIRMAN OF THE BANQUET COMMITTEE.

### *Scientific Study of Man Needed*

"Only through a concerted, scientific study of man, as well as of machines," he asserted, "can we make full use of our God-given powers to improve man's mental capabilities and his spiritual outlook."

At the outset of his address, General Sarnoff disclaimed any "specialized" knowledge of the fields which he planned to discuss before the medical congress.

"I appear before this notable group of experts on medicine in the role of an amateur," he said, "but I gain some measure of courage from the fact that I also began my career as a wireless amateur. After 43 years in radio, I do not mind confessing that I am still an amateur. Despite many great achievements in the science of radio and electronics, what we know today is far less than what we have still to learn.

"Probably the same may be said of biology and medicine and of many phases of the older physical and social sciences. The opportunities that lie ahead for research and development in all these fields, and especially in the new divisions of science involving atomic energy and radiobiology, would seem to be unlimited."

General Sarnoff said the subject of atomic energy has long fascinated him. He recalled that, in fact, in 1945, before the splitting of the atom created the death-dealing blast at Hiroshima, he had prepared a paper entitled "Science for Life or Death"—the theme of which was atomic energy.

At that time, he said, he thought primarily of the application of atomic power to science, industry and warfare. Since then, his thinking has been directed to the possibilities of atomic energy and electronics, inside of man as well as outside of him.

"It is my belief that controlled atomic energy puts us on the threshold of new opportunities. Coupled with electronics, it offers vast possibilities to look inside of man—and perhaps to discover what makes him function and why he behaves as he does.

"Men have explored and have be-

"THE FISSION OF THE ATOM TURNED THE HARSH DREAMS OF A RUTHLESS EMPIRE INTO BARREN REGRETS."

gun to comprehend the very hearts of atoms. Yet, they largely fail to understand each other. Men may see and hear electrically to the utmost limits of this planet. Yet, their minds fail to cross even the narrow boundaries of their individual and group consciousness. Nor do they understand how their thoughts and emotions are born and by what power they grow to fruition.

"Is this force electricity? Is the human body an electric power house? Does it have a communication system that continually radiates waves of thought and emotion?

"When we understand each other, is it because we are attuned to each other electrically, or should I say electronically, in much the same way that a distant radio receiver is in tune with a broadcasting station? If this be so, we should learn the electrical characteristics of the human body. We should learn how its communication system functions. That cannot be done alone by social science or psychiatry. It calls for the help of the physical sciences, including the science of the electron and the atom."

General Sarnoff reported that electronics, first associated with radio, is spreading into many fields of activity, including medicine. He told how the electron microscope has revealed new and unknown worlds in the study of bacteria, viruses and the internal structure of the human cell itself.

"We may well hope, therefore," he continued, "that the electron and its atomic companions will lead us to the cure of dread diseases. And it may be that in the further study of man's electrical frequencies and his intercommunication system—in the application of electronics to the human body—we shall develop a new branch of science. Coining a new word to describe it, I would offer the term 'Radionetics'.

"Recently, in this field, eminent physicians have reported the development of electro-acoustic devices, sonic and ultra-sonic, as aids in the detection of kidney-stones and gall-stones, in the location of foreign objects in the body, as well as tumors in the brain. Further, a new technique for detecting cancer of the cervix has been reported, in which a simple electrical test shows when a malignant growth exists in the body.

### *Atomic Tracers to Fight Disease*

"Cancer is a scourge. We are told that this malignant growth destroys living cells. To fight the disease, we attack the malignant growth and, by so doing, run the danger of destroying healthy tissues and thereby destroying life itself. Scientists have expressed the hope that atomic tracers may be sent through the body to ferret out the spots where malignancy is attacking and killing the living cells. By this new means, the physician may be able to act early enough to repair and restore the cells under attack.

"If human cells can be destroyed, why should there not be some way to protect and heal them without resorting to surgery? There would seem to be some reason for hope in this idea, for already we have discovered how to split, change and control the atom and its energy. If we can learn how to do the same with the human cell, we may discover how to control the individual cells of man and thus be enabled to improve the functioning of the human body."

General Sarnoff declared that this is but one of the possibilities that emphasizes the urgency of a penetrating study of man himself, as well as of the methods and plans which would secure to all mankind the benefits to which the individual instinctively feels himself entitled.

"The need of such a program cannot be over-emphasized," he asserted. "The impact of new scientific advances on the mind, emotions, and physical makeup of man has been profound and at times bewildering.

### *Science Affects Human Habits*

"Atomic energy, electrical power, instant communication, winged transportation, radio, television, motor cars, and a host of other dynamic manifestations of life have basically changed the human environment. No wonder so much of humanity finds its surroundings confusing and, therefore, is unable to adjust itself to these rapid changes."

There is grave need for a new type of scientific worker or, to be exact, groups of workers and associates, to conduct as their supreme quest—the study of man, continued General Sarnoff. He stated that these scientists should not only be highly skilled experts capable of carrying out original research in their own fields, but also well-informed and capable of understanding the techniques, methods, and data of allied fields. They should be able to apply the knowledge of their own specialized fields to the other branches of science, he said, and added:

"Until scientists possessing this

'over-all knowledge' can evolve, specialists should be coordinated in carefully associated groups. On the one hand, there will be needed experts in mathematics, physics, chemistry, and engineering, to provide the fundamental methods, physical laws, apparatus and analogues necessary to a research on man himself.

### *Skilled Men Must Be Assembled*

"But there must likewise be assembled correspondingly skilled men in the fields of biology, psychology, and medicine. The latter will define the problems, analyze them, and use their cumulative knowledge of science towards finding the solutions.

"Fortunately, significant beginnings have been made toward accomplishing these aims. An important instance of such integration of the various branches of science is found in the work of Norbert Wiener, a professor of mathematics at Massachusetts Institute of Technology. He has applied the theory, methods, and equipment used in the fields of communications and electronics to the study of biological processes. He has termed this new study of the behavior of living things, in the broad light of their communications aspects, 'cybernetics', a term derived from a Greek word meaning the 'steersman' — thus indicating the governing function of communications in living bodies.

"Another instance of coordinated attack by physical and biological scientists has been made by the Sloan-Kettering Institute for Cancer Research and the Memorial Hospital in New York. I am happy to say that the Research Laboratories of the Radio Corporation of America are cooperating with the Memorial Hospital in this vital work. For this privilege we are indebted to Mrs. Albert D. Lasker, who first suggested the idea to me and arranged a meeting between the scientists of RCA and of the Memorial Hospital which led to this cooperative effort."

General Sarnoff told of the need for a wide variety of ultra-modern tools, including electronic calculators, television-scanning processes, and measuring devices, to conduct the research.

He said there are many lines along which such an intensive study of man might proceed, one of the most promising directions being to select that element in man which is found at the smallest end of the scale—namely, the living cell. He reminded his audience that, considered as a biological specimen, man consists of trillions of such individual cells. Each carries an indication of the nature, personality, and behavior of the individual to whom it belongs. Each cell also carries some mechanism or structure which controls its own functions as well as its part in the life of that particular human being, he said, and recalled how the cellular assembly known as an animal is provided with an amazing intercommunication system, similar in many ways to that known to radio experts.

It is within the realm of possibility, he declared, that investigations may teach us how to improve the functioning of the communication system of man himself, and may also teach us how to repair defects or how to substitute artificial channels for those that have been worn out or destroyed by accident or disease.

General Sarnoff stressed the importance of working in the world of the infinitesimal, of studying the power of little things in the hitherto unseen, sub-microscopic world.

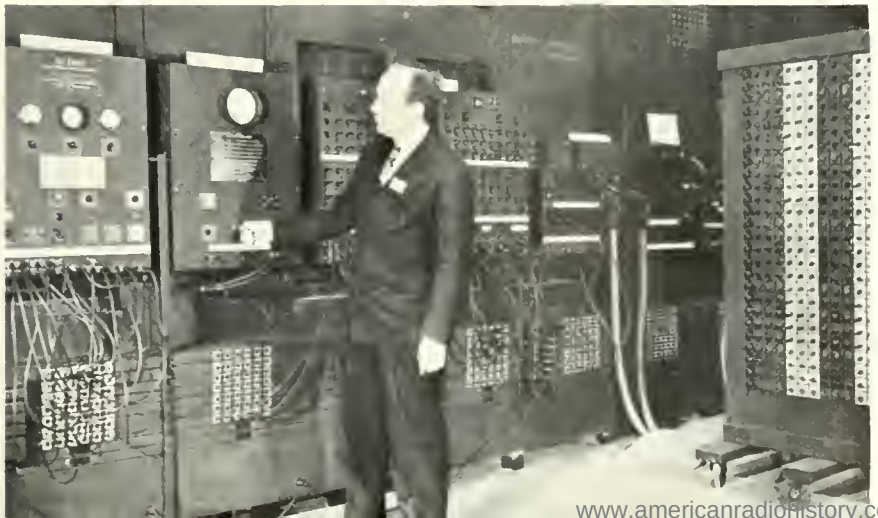
He said that by dealing with tiny things, man has released atomic energy and "literally clasped hands with Nature".

"So we may be watching the birth of a new philosophical concept, based on dependence on the tiniest elements," he confided. "Its human and physical significance may well be incredibly greater than that of the older modes of thought which centered on large bodies or theorized vainly and incorrectly about small ones."

The course of research into the utilization of atomic energy in the human body has already begun and it has progressed to a point where it is rapidly becoming significant, he continued, pointing out that physicists have learned how to make artificial radio-active elements, which release atomic energy in the form of rapidly moving matter of more or less powerful radiation. On an extremely minute scale, they are the original atomic bombs, he said, adding:

"These synthetic radio-active ele-

"COMPUTING MACHINES EXIST WHICH CAN PERFORM SOME OF THE FUNCTIONS OF THE HUMAN MIND — BUT FAR MORE SWIFTLY THAN ANY MIND CAN THINK."



"THE ELECTRON MICROSCOPE HAS REVEALED NEW AND UNKNOWN WORLDS IN THE STUDY OF BACTERIA, VIRUSES AND THE INTERNAL STRUCTURE OF THE HUMAN CELL ITSELF."

ments are now in ample supply. They can be introduced into living beings and their action in the body studied by electrical, photographic, and other means. They open the door to a host of new biological and medical techniques.

"These substances have been aptly termed 'tracers'. In living organisms they act as 'biological detectives' and reveal much that would otherwise be unknown. This is a branch of scientific investigation which is already in rapid evolution. It will facilitate the detailed study of body functions, metabolism and circulation in the living animal . . .

"One may pass into the realm of speculation at this point by assuming that atomic energy will not only serve for the treatment of abnormal conditions of the human body but may be used to repel bacterial invaders and perhaps strenghten and stimulate normal cells and tissues.

"How far such tissues and their cells might be increased in their efficiency and probable life span is so far unknown. Who can say how powerful and long-lived man may become as he learns further how to master these fundamental cosmic forces and to apply them to himself as well as to the outside world?"

Under existing conditions, he said, modern man is subjected, to an increasing and dangerous extent, to the need of living at high speed under continued and sometimes intense strain, and to the necessity for enduring these conditions for prolonged periods. As a result, many persons suffer severely, particularly in their nervous systems.

Sedatives and similar expedients are poor substitutes for a stronger, more enduring nervous system, he continued, adding:

"Maybe correctly selected and applied forms of atomic energy will feed and strengthen our nervous makeup, thus helping us better to meet the pressures of life.

"Today man is largely ruled by his emotional reactions. Perhaps, even the human brain can be strenghtened in its relation to the remainder of the human controlling mechanism. If so, much good would come to mankind."

### *Discusses Atomic Power*

Discussing the possibility of controlling the atomic power within man himself, General Sarnoff had this to say:

"This at least is certain: if man were capable of releasing and beneficially controlling even a minor portion of the atomic energy within himself, his powers would be tremendously enhanced.

"What is more, there would be placed at his disposal a practically limitless reservoir of energy. Today, men face such questions as: Why does our individual store of energy deteriorate and our physical and mental power progressively weaken until eventually we die?

"Often old age and its cramped capabilities are inflicted too early in life. Could it be that our stores of energy are atomic in character? Could it be that through lack of our control of them they gradually decrease and finally fail? . . .

"We have but to reflect that plants feed on sunlight—a form of radiation. If radiation of one sort may bring into the world the beauty of a flower, the growth of a tree and of food for our bodily nourishment, may not energy or radiation of another sort bring strength, order, and endurance into the human frame?

"It is true that today we have no more idea of just how such a process could be carried out than primitive man had of the action of radio, television, or nuclear fission. But the unknown is not the unknowable. In the case of atomic energy, there is a strong intuitive feeling that this agency will yet lay rich stores of amazing gifts before us, if only we have the determination to overcome the barriers which now guard these gifts."

Describing the cosmic nature of man, with his self-contained aggregation of matter and energy, General Sarnoff pointed out that were we to regard man as an evolving cosmos within himself, there would seem to be many capabilities and potentialities as yet unrealized. Thus the theory of the cosmic nature of man suggests the possibilities for speeding up these evolutionary processes, he said.

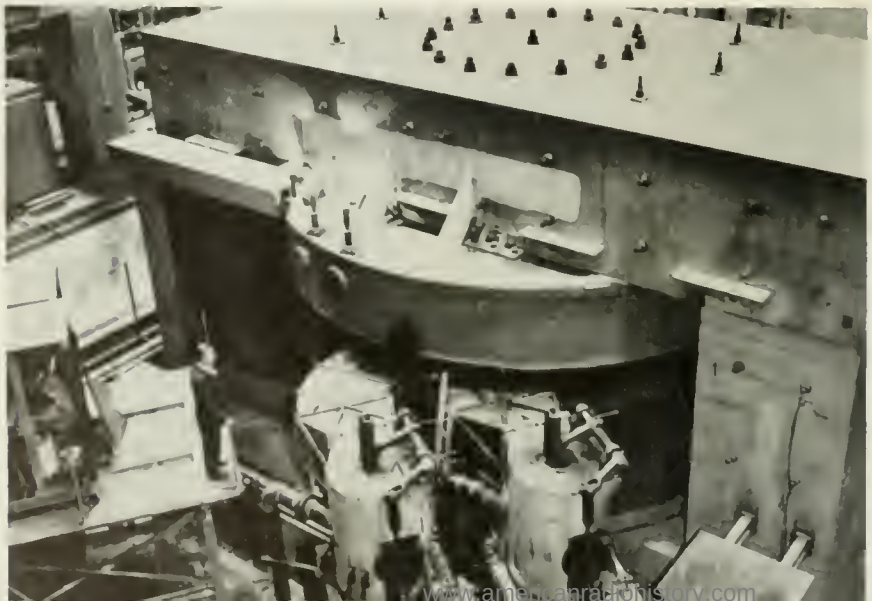
### *Man Struggles for Survival*

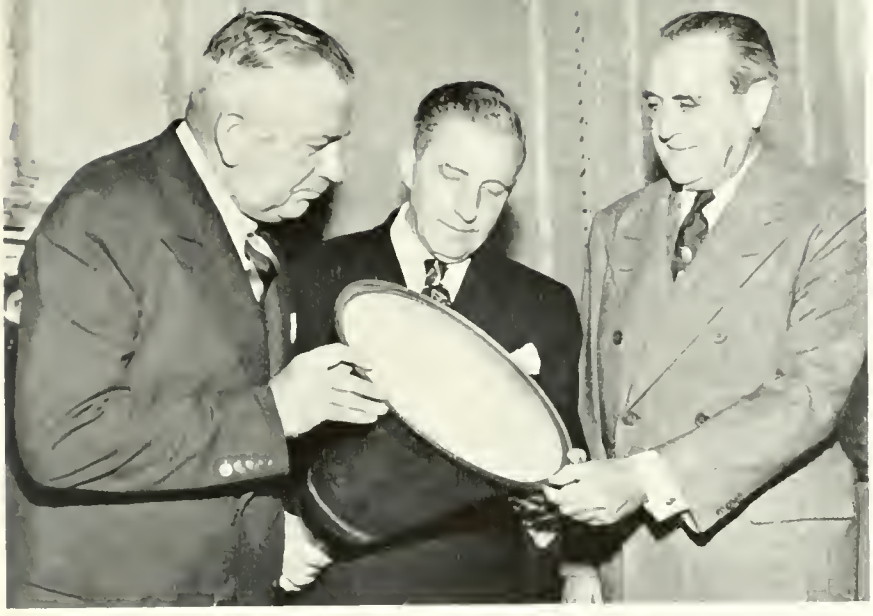
"In the history of mankind, the struggles of men often have been mainly for sheer survival," he recalled. "For his continued existence, man has needed food, shelter, and clothing. The world wars which devastated the earth have sprung primarily from the desire on the part of one or another people to control the limited resources of this planet. Vital resources are not evenly distributed on this earth and this fact has produced dissatisfaction and hatred.

"With the increase in our understanding of the universe and of our mastery of the great forces of atomic energy, the struggle for mere physical survival should disappear. With freedom from this physical struggle, the opportunity for advancing mentally and spiritually will be immeasurably increased.

*(Continued on page 11)*

"ALREADY WE HAVE DISCOVERED HOW TO SPLIT, CHANGE AND CONTROL THE ATOM AND ITS ENERGY."





FRANK M. FOLSOM, RCA PRESIDENT, L. W. TEEGARDEN, VICE PRESIDENT IN CHARGE OF TECHNICAL PRODUCTS, RCA VICTOR DIVISION, AND NILES TRAMMELL, PRESIDENT OF NBC, EXAMINE THE MILLIONTH TELEVISION PICTURE TUBE PRODUCED BY RCA.

# THE MILLIONTH TV TUBE

***Production of "Milestone" Kinescope at Lancaster Plant Observed by Television Viewers on 11-Station Network***

THE millionth television picture tube to be produced by the Radio Corporation of America rolled off one of the production lines at the Company's Lancaster, Penna., plant on June 7, under the eyes of RCA officials and millions of televiewers along the Atlantic Coast and as far west as Chicago. The tube, which climaxed three years of intensified efforts to produce sufficient kinescopes for the mushrooming television industry, was a 16-inch metal-cone tube. Upon its completion and subsequent test, the tube was inserted in an RCA Victor receiver and presented to the Valley Forge Hospital for veterans.

In an address which was part of the activities celebrating this milestone in television progress, Frank M. Folsom, RCA President, recalled the spectacular rise of the video industry since 1946.

"In that period," he said, "we have seen the number of television stations grow from five to 67, so that today this new service is within reach of 70 million people. We foresee continued progress. Technical improvements will be forthcoming from our laboratories and they will be passed along as they are perfected."

During the special 45-minute television salute, which also signalized the official opening of Lancaster's first television station, WGAL-TV, scenes of activities within the busy tube plant were transmitted over an NBC Television Network of 11 stations. Using facilities provided by coaxial cable and radio relays, viewers in Washington, Philadelphia, Boston, Baltimore, Richmond, Buffalo, Cleveland, Detroit, Chicago, Lancaster and New Haven were given an eye-witness step-by-step visual description of the actual manufacture of the millionth tube. With Commentator Ben Grauer explaining the sequence of scenes as they were picked up by a battery of NBC image orthicon cameras, TV set owners watched the "milestone tube" from its beginning, as a number of individual parts, to its completion as a high-quality kinescope, checked, inspected and inserted into a receiver.

### *Tube Assembly Revealed*

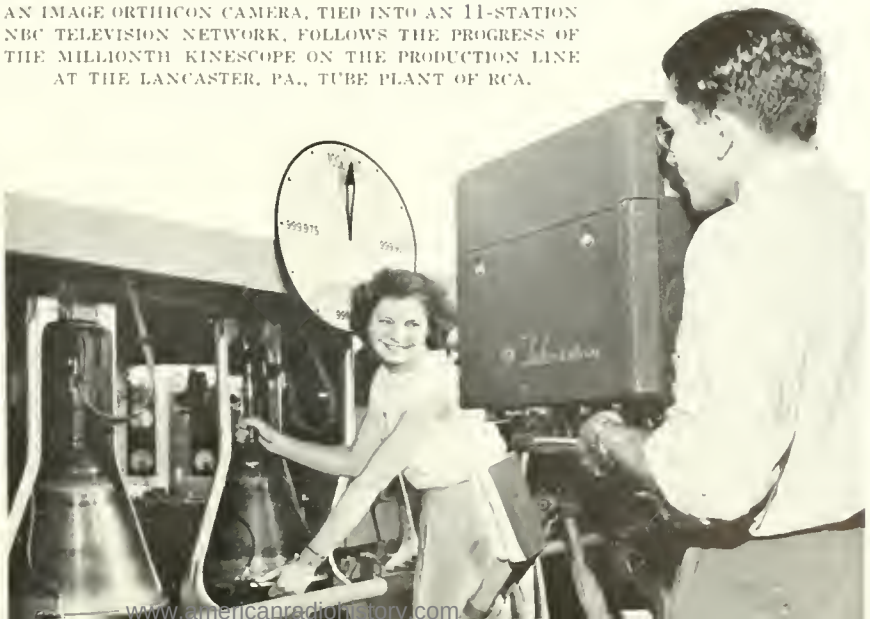
These viewers saw jets of intense flame weld the metal cone to the glass tube forming the neck and to the glass face plate which eventually would be the viewing screen of the kinescope. They witnessed the insertion of the finely-engineered and intricate electron gun into the neck, and then the majority of viewers learned, for the first time, how the fluorescent material which forms the picture screen was poured into the tube as a liquid solution and allowed to settle out into position on the face plate.

During the telecast from Lancaster, NBC shifted the action briefly to its New York studios for the address by Mr. Folsom and a musical selection by Miss Blanche Thebom, Metropolitan Opera star.

Mass-production of the complex and sensitive television picture tube on a conveyor-belt and automatic machinery basis, first achieved at the RCA Lancaster plant in 1946, assured the industry of a large-volume supply of the most vital component in a home television receiver. This was followed by the mass-production and mass-marketing of home television receivers and the opening of today's mass-television era.

Source of about half of the television picture tubes now in use in

AN IMAGE ORTHICON CAMERA, TIED INTO AN 11-STATION NBC TELEVISION NETWORK, FOLLOWS THE PROGRESS OF THE MILLIONTH KINESCOPE ON THE PRODUCTION LINE AT THE LANCASTER, PA., TUBE PLANT OF RCA.



LANCASTER PLANT MANAGER D. Y. SMITH PRESENTS THE MILLIONTH TUBE AND AN RCA TELEVISION RECEIVER TO MAJOR MARJORIE MIRTIN REPRESENTING THE VALLEY FORGE HOSPITAL FOR VETERANS.

all home receivers throughout the country, the Lancaster plant was built and operated during the war by RCA as the largest supplier of cathode-ray and power tubes for critical war equipment.

At the end of the war, RCA purchased the plant from the U. S. Navy and expended a million dollars for the development of high-speed automatic machinery specially created for processing metal and glass tubes.

### *Plant Capacity Doubled*

Since that time, further development of equipment has more than doubled the plant's capacity. And now, in addition, RCA is constructing a new manufacturing center at Marion, Indiana, which will be devoted entirely to production of the company's newly introduced 16-inch direct-view metal-cone picture tube.

In producing a million kinescopes, enormous quantities of material were needed. The glass that went into the formation of the tube envelopes weighed more than 3,000 tons. Fifteen hundred tons of stainless steel; 81 miles of tungsten wire; 15,000 gallons of liquid air, and 800 miles of nickel and copper wire were consumed. The various processes required 22,000,000 kilowatt hours of electricity, and to ship the total output of the plant at one time would have required a train of nearly 1,000 freight cars.

Yet the quantities of these major materials are no more amazing than the variety of substances which went into the fabrication of the tubes themselves, for of the 92 known basic elements in the earth, Lancaster scientists and engineers found use for more than half of them.

## Radomes Improve NBC Microwave Reception

*(See cover picture)*

Two plastic housings for microwave-relay receiving equipment have been erected by the National Broadcasting Company on the roof of the 69-story RCA Building, Radio City, New York, for the purpose of improving the pickup of television programs originating outside the NBC studios. The plastic huts, called "radomes", provide an all-weather point-of-reception at Radio City for video programs transmitted from temporary field locations within a 30-mile radius.

According to O. B. Hanson, NBC Vice President and Chief Engineer, the receiving equipment in the radomes consists of a six-foot parabola which concentrates the short radio waves — only about $1^3/_4$ inches in length — toward a waveguide element located at the focal point of the parabola. The latter may be rotated vertically and horizontally for greatest efficiency in picking up the signals. Provisions are included for heating the radomes in winter and ventilating them in summer.

## J. H. McConnell Elected Executive V.P. of RCA

Election of Joseph H. McConnell as Executive Vice President of the Radio Corporation of America was announced by Frank M. Folsom, President, following a meeting of the Board of Directors on July 1.

Mr. McConnell, Vice President in Charge of Finance of RCA since January 7, 1949, has been associated with the Corporation since 1941. In that year, he joined the Legal Department of the RCA Manufacturing Company, now the RCA Victor Division. He became General Counsel of that organization in 1942, and three years later he was elected Vice President and General Attorney of the RCA Victor Division. From April, 1947, to January, 1949, he served the same Division as Vice President in Charge of Law and Finance.

A native of Davidson, N. C., Mr. McConnell was graduated from Davidson College in 1927. In 1931, he received a Law degree from the University of Virginia. He practiced law in West Palm Beach, Fla., and in Charlotte, N. C.

In 1935, Mr. McConnell became an associate in the New York law firm of Cotton, Franklin, Wright & Gordon (now Cahill, Gordon, Zachry & Reindel), where he specialized in legal phases of government regulation of corporate enterprise. He is a member of Phi Beta Kappa and Kappa Alpha fraternities.

JOSEPH H. MCCONNELL

# Television and Human Rights

*Possible Invasion of Privacy by Video Cameras Presents Constant Problem to Producers of Television Programs*

By Robert P. Myers

*Assistant General Attorney*
*National Broadcasting Company*

WHEN television attorneys go to bed at night they don't count sheep to fall asleep — they count rights. They count music rights; they count literary rights, motion picture rights, civil rights and defamation, as well as commercial rights and a host of contractual rights. If the video lawyer is still awake, he can try to figure out whether his station's television cameras that day invaded the right of privacy of an African potentate at a football game.

The insomniac barrister is mostly involved these days with the very complicated problem of music rights. The complications involve the working out of a new agreement with the American Society of Composers, Authors and Publishers which will replace the so-called "free" license which has existed for musical performances on television since 1941. As many of you know, the Television Music Committee of the National Association of Broadcasters (NAB) and the television networks have been conducting a series of negotiations with ASCAP on this very problem.

The big problem of working out an ASCAP agreement lies in the scope of the rights which the organization possesses from its members for television. The problem of a general licensing agreement for some of its music and special licensing arrangement for others of its works, is the one on which broadcasters and ASCAP now are hinging their negotiations. However, all of us feel that an equitable arrangement will be arrived at to permit the further use of ASCAP music on video.

The music problem, which happens momentarily to be in the television legal limelight, is but one of scores of new problems that have arisen with the growth of video.

### *Camera May Invade Privacy*

Another sore point is the possibility that the probing electronic eye will invade a person's right of privacy. As an example, suppose that General Marshall were attending the Army-Navy football game: The cameras, spotting him as he entered the arena, would naturally follow him through the portals, up the aisle, and into his seat. I believe this is a matter of legitimate public concern and interest. What's more, every now and then — say after an Army touchdown — the cameras would have a perfect right to "pan" the crowd and settle on General Marshall in the act of cheering the action. But if the broadcaster were to place a camera on Marshall for the duration of the football game, then this would cease to be a news use and become a feature treatment of Marshall. In this instance, it would be a definite violation of his civil rights and he could sue the telecaster for invasion of his right of privacy.

This is, obviously, an extreme case but nonetheless it points up the fact that at times there might be a very thin line between the use of television cameras to cover "news" and the making of a "feature" about a personality which could be construed as an invasion of the right of privacy.

As a general rule, it must be remembered that a person cannot be held up to ridicule, that the cameras can cover matters of legitimate public interest but that no individual should be featured except in a true news sense. At public gatherings, such as football games, it is certainly permissible to "pan" crowds. Many court decisions have arisen out of these points as they relate to motion pictures, but as yet there has been no clear-cut test regarding television uses. However, a definite pattern has been evolved as a result of past experiences. It is clear that a camera pointing its eyes to a remote and dark spot in a pickup of a night club could invade the right of privacy of two individuals located in that spot. However, in pickups such as those NBC has been making from the Village Barn, where the individuals are apprised in advance that a television broadcast is being staged, the NBC attorney feels that their antics can be covered without much fear of reprisal.

Where a person is held up to ridicule or embarrassment by the television camera, the broadcaster could find himself in trouble. The telecaster must also avoid misrepresenting a person and his actions or

*(Continued on page 13)*

TELEVISING GATHERINGS SUCH AS SPORTS EVENTS IS NOT ORDINARILY CONSIDERED AN INVASION OF THE RIGHT OF PRIVACY IF THE CAMERA PICKS UP A PANORAMA OF THE CROWD AND DOES NOT CONCENTRATE ON AN INDIVIDUAL.

# Viewers Rate Television Programs

*Studio Audience Notes Reactions with Hand-held Indicators — At Home, Criticism Is Registered by Cues on TV Images*

By Hugh M. Beville, Jr.

*Director of Research*
*National Broadcasting Company*

NBC television is pioneering the field of television research with audience reaction tests, working in cooperation with the Horace Schwerin Research Foundation. The Schwerin System of program-testing utilizes electrical recorders that measure not only immediate individual and collective audience reaction to program content, but also study such related factors as size of viewing screen, film versus live presentation, viewer fatigue, and many others.

In setting up the test situations, NBC exhibits kinescope recordings of its top shows in the RCA Johnny Victor Theatre two or three times a week. Audience reaction is taken with the Schwerin "TV Test-Trigger", an instrument which records the likes and dislikes of up to 80 individuals attending an NBC "Television Review Time" session. Each audience member moves the instrument's knob to indicate "Good," "Fair" or "Poor". Each movement of the instrument is recorded by automatic pen, resulting in an individual and collective "profile" of the video show.

The inauguration of regular qualitative testing of TV shows here at NBC is another indication of the speed with which television is pushing to the fore as a communications medium. It is a further step in NBC's TV research program which now includes such features as regular monthly estimates of TV set ownership by cities and surveys in places and periods not covered by syndicated services.

### *Questions Raised By Television*

Some of the old and new questions raised by television, according to Horace Schwerin, president of the research organization, are:

What do audiences think of programs now on the air?

How should sequencing of programs be arranged?

Which camera techniques are most acceptable?

How long can scenes be held before liking diminishes?

Are film presentations better liked than live shows, or vice versa, and why?

How long will an audience spend in front of a TV set?

What shows can be effectively broadcast simultaneously on radio and television?

How effective are various types of TV commercials?

Who is available to see daytime programming, and what kinds of programming have greatest appeal for this group?

How can specific programs be slanted toward their primary market audience?

On May 17, NBC and Schwerin Research tested simultaneous home reactions of 13,000 midwest televiewers to "Quiz Kids." Reactions of the huge home sample, largest ever obtained in qualitative television or radio research, were matched with reactions of two different types of studio "control" audiences in New York in the most comprehensive and far-reaching program-testing project ever attempted.

Revolutionary feature of the home-viewer test was Schwerin's application of the "number-cueing" principle, basis for his organization's AM radio testing, to television. Set-owners in the three TV areas viewing "Quiz Kids" also saw small numbers, flashed for 3 seconds each at approximately 40-second intervals, superimposed on the picture which appeared on their screens. As they watched the show, they indicated on ballots, which were mailed to them prior to the

THE POPULAR "QUIZ KIDS" PROGRAM WAS ONE OF THOSE JUDGED BY A SECTION OF THE TELEVISION AUDIENCE USING THE SCHWERIN SYSTEM OF ANALYSIS.

RICHARD PAIGE AND HORACE SCHWERIN DISPLAY THE "TV REACTION RECORDER" WITH ITS 80 TRACING PENS EACH OF WHICH IS CONNECTED TO A "TEST TRIGGER" MANIPULATED BY A MEMBER OF THE STUDIO AUDIENCE.

THE "TEST TRIGGER" (BELOW) IS HELD BY A VIEWER WHO MOVES THE CENTER KNOB TO "POOR", "FAIR" OR "GOOD" ACCORDING TO HIS REACTION TO PORTIONS OF THE PROGRAM.

show's performance, how they judged portions of the program.

Only one of four "sample groups" being utilized in the Schwerin project used the "number-cueing" system. Recapitulation of techniques and size of sample groups being used look like this:

Nine thousand midwest TV families (random sample) voting on live telecasts by the "number-cueing" method.

Four thousand additional midwest TV families, voting simultaneously on the live telecast, using "pictorial question" ballots on which successive elements of the show were listed under pictures of Joe Kelley and the Quiz Kids.

Twelve hundred pre-selected television viewers in New York, voting in four 300-person NBC studio sessions on the kinescope recording of the program, projected on a theatre-size screen, using the "number-cueing" method.

### *Audience Records Reaction*

More than three hundred additional New Yorkers, viewing the kinescope recording on a closed circuit TV projection set, in groups of 75 each at the RCA Johnny Victor Theatre, used the "TV Test Trigger" and electric pen recording units.

Some of the questions this test will answer, are:

How enjoyable and effective are "panel quiz" shows?

To what extent are visual "gimmicks" necessary?

How do audiences react to the TV version of "Quiz Kids" compared to the AM version?

Which types of questions are most popular?

How should the commercials be handled?

Which groups (by age, sex, income, education) like which portions of the program best, and which least?

Television in 1949 is in its mature period. Of all the refinements and improvements in store for the viewer and user of video in the future, none is more important than the NBC-Schwerin testing project. We are sparing no expense to equip our test studios with multiple receivers, projectors, screens, electrical recorders and many other technological items. Our purpose is to provide reliable data on audience likes and dislikes in television, so that our regular advertisers and those who haven't yet tried television will be able to approach the new medium with confidence and familiarity.

NBC predicts that no video event of 1949 will surpass the Schwerin tests in ultimate importance to both sponsor and consumer. We have come through the experimental period in television; now we're ready to apply the acid test of audience reaction to our programs and program ideas.

## MAN AND SCIENCE

*(Continued from page 6)*

With greater powers and better functioning of our physical bodies, may we not reasonably hope for a corresponding improvement in our mental capabilities and spiritual outlook?

"In conclusion, I would like to repeat my belief that the new tools, including electronics and atomic energy, which science continues to make available, put us on the threshold of new opportunities. Likewise, they impose upon us great obligations to use them constructively. The hour has come to bring their vast potential benefits to humanity through concerted and systematic research for the development of man himself. Only through such coordinated scientific efforts can man be assured of his survival in this Atomic Age and of the full use of his God-given powers to progress, to live in peace, and to fulfill his destiny."


PILOT BOAT NEW JERSEY, SHOWING THE UNUSUAL "HALO" ANTENNA AMIDSHIPS WHICH PICKS UP TELEVISION SIGNALS FROM NEW YORK AND PHILADELPHIA REGARDLESS OF THE POSITION OF THE SHIP WHEN STATIONED OFF NEW YORK HARBOR.

PILOTS AWAITING THEIR TURN TO GUIDE SHIPS INTO THE HARBOR PASS THEIR TIME WATCHING VIDEO PROGRAMS ON AN RCA 16-INCH RECEIVER IN THE SHIP'S SMOKING LOUNGE.

# Harbor Pilots Boost Television

*Receiver Installed on New Jersey Relieves Mariners of Boredom While on Station off New York Harbor*

IN 1947, the pilots who guide the world's largest ships—and many smaller ones as well—into and out of New York's traffic-laden harbor installed an RCA Victor television receiver aboard the Pilot Boat *New Jersey*, one of their three floating "homes", thereby joining the progress parade of their land-lubber friends. Now, 20 months later, this group of mariners confesses that long-established shipboard routines have been drastically revised by the advent of television.

The transition took place almost overnight. Images on the receiver's 10-inch screen moved in to take precedence over marathon card games, the reading of books and magazines, and other time-killing devices. Those long evenings which the pilots had faced during tours of duty at their station many miles outside the entrance to New York Harbor became merely a memory. Once again, the magic of television had demonstrated its ability to alter prevailing habits of living.

Recently, the Sandy Hook pilots went a step further. They replaced their original receiver with one of RCA's new models equipped with a 16-inch metal-cone picture tube. This gives larger, clearer pictures and results in less jockeying for the best viewing positions in the smoking lounge.

Television has made inveterate fans of the men, with prizefights rating top priority on their program list. Normally, few seafaring men become boxing fans for the obvious reason that they get little opportunity to attend actual bouts ashore. Now the television screen has brought the squared circle to the harbor pilots, and, to a man, they have developed into ringside "experts".

### *Special Antennas Designed*

Before the original installation was made, Robert Gray, Joseph Shuskus and Joseph Rudolph of the RCA Service Company made several trial runs on the *New Jersey* experimenting with several types of antennas. They finally designed a special "halo" antenna which, because of its circular shape, enables the *New Jersey* to pick up all signals clearly, no matter how the ship turns, sways, or tosses. A rotary converter, installed by the RCA Service Company, solved the problem of changing the ship's direct current to the alternating current required by the RCA set. In addition, the converter isolated the receiver from electric disturbances created by the many motors and generators which otherwise would have affected the picture.

At all times, reception has been excellent, despite the pitch and roll of the ship. The men watch programs from the six television stations in New York and vicinity and, occasionally, are able to pick up the three stations in Philadelphia, over 75 miles away. Frequently, wooden benches must be brought in to accommodate the crowd which sometimes numbers as high as 35 men.

"Selection of programs is quite a problem," one pilot remarked. "Our tastes differ greatly, but the first man to reach the set usually wins out. Boxing seems to be the one subject on which we all can agree."

The pilots also enjoy baseball, wrestling, dramas and variety shows, such as the Milton Berle program. They often sit in the lounge, smoking their pipes, from early evening until the last video program goes off the air. Television, to a great extent, has taken the place of radio, card games and story-telling—the century-old pastimes of seamen.

Life on the *New Jersey* is sometime exciting but more often on the

dull side. When she leaves the pier on Staten Island for duty just outside the harbor, the ship carries about 27 licensed pilots and 25 crew members. For two-week periods, the *New Jersey* drifts off Ambrose Light, sending pilots onto incoming liners and picking up those who have just guided outgoing vessels through the channels and traffic of the Bay. Since the men spend more time aboard ship than they do in their homes, television has shortened considerably the long stretches between dockings.

Taking TV to sea has proved a boon to the seamen and the industry alike. As a result of the excellent reception and variety of entertainment afforded them by the shipboard installation, ninety per cent of the pilots have purchased television sets for their homes.

The fact that the *New Jersey's* pilots had become such confirmed television fans had one drawback. In spite of the excellent reception and sharp pictures provided by the original RCA installation the 10-inch screen proved inadequate for the many spectators who strained, at times, to catch each movement. The idea of substituting a new RCA set with 126 square inches of picture area was welcomed by all. When the RCA Service Company completed installation of the new receiver, the 10-inch instrument was transferred to the *New York*, sister-ship of the *New Jersey*.

RCA TECHNICIANS ERECTING THE TELEVISION ANTENNA ABOARD THE PILOT BOAT NEW JERSEY. THE SMALL LOOP BELOW THE LARGE ANTENNA IS FOR STATIONS ON CHANNELS 7 TO 13.

### *Three Ships in Pilots' Fleet*

The Pilot Associations, which operate independently, maintain three ships, the *New Jersey*, *New York* and *Wanderer*, as well as four motorboats for transporting the men between their headquarters and incoming vessels. When the *New Jersey*, largest and most extensively used of the trio, is in drydock, operations are transferred to the *New York*. By popular demand the 10-inch television set also was transferred but the 16-inch receiver has been made a permanent fixture on the *New Jersey*.

"Television's trial run at sea has been most successful," the pilots declared, "and thanks to RCA craftsmanship it has proved both indispensable and seaworthy. Despite the heavy vibrations and strenuous use which the smaller set has undergone, it has remained in excellent condition.

## Television and the Invasion of Human Rights

*(Continued from page 9)*

misnaming him. These could both result in defamation actions.

There are scores of problems, too, on the subject of literary rights, and especially in dramatic works from which motion pictures have subsequently been made. There are copyrights involved, common law rights, and others. In each case, negotiations have to be made on an individual basis since there are no blanket or general licenses covering dramatic works. Rights in dramatic works may be vested in the author, but in plays which have been sold for motion pictures these rights may have been sold, too. Each contract for dramatic works has to be checked for both live and kinescope recording. In addition, when motion picture performing rights have been procured there exist subsidiary rights, such as the fact that the movie itself may be copyrighted, that music must be cleared, that rights inhere in talent, producers, directors, etc.

In the event that television broadcasters cannot obtain general licenses covering a substantial majority of the rights which they will utilize — making it necessary for them to negotiate hundreds of individual licenses each month — it may become desirable if not necessary to create a central clearance bureau for rights, with offices in the principal centers where the owners of such rights are located.

## Advanced TV Courses by NBC and Columbia Univ.

Study of television techniques will be incorporated in 25 professional training courses to be offered during the 1949-50 academic year by Columbia University School of General Studies in cooperation with the National Broadcasting Company.

The teaching staff will be recruited largely from NBC network personnel, with the majority of courses to be given under working conditions in the NBC studios in Radio City, New York. Fourteen network executives are listed as instructors.

The curriculum has been designed to give fullest possible coverage of radio and TV. There will be courses in basic radio and TV, dramatic writing, news writing, promotion, publicity, news commentary, speech, announcing, acting, use of equipment, sound effects, audience research, international relations, production and direction, music and the documentary.

More than 400 persons from over 40 states and many foreign countries registered for the radio-TV courses last year.

PUPILS OF THE LAWTON SCHOOL, PHILADELPHIA, APPEAR BEFORE THE TELEVISION CAMERA IN A PLAYLET, "A VISIT TO ITALY."

# "OPERATION CLASSROOM"

## *Educational Television Introduced to Schools in Philadelphia Area Through Cooperation of RCA Victor with Local Agencies and Institutions*

By Gilbert Chase

*Manager, Educational Division, RCA Victor Division.*

EARLY this year the Public Relations Department of RCA Victor, through its Educational Division, mailed to nearly 12,000 educators throughout the country, an eighteen-page illustrated booklet titled "The Modern School Looks at Television". This was intended to answer some basic questions relating to the use of television in schools, and, in the words of Frank M. Folsom, President of RCA, to inspire the interest of educators "in helping to develop what may become the greatest teaching medium known to man". To each brochure was attached a business reply card in which the sender requested further information on the development of educational television. To date nearly three thousand replies have been received. Here is conclusive proof that American educators are fully alive to the possibilities of television as a teaching aid.

Meanwhile, exciting events were taking place in television for schools around the Philadelphia area. Theory was being translated into action. Prophecy was being transformed into history. The schools of Philadelphia and Camden were actually and literally "looking at television", not in an abstract and speculative manner, but in terms of concrete reality, as an experience shared by thousands of pupils and teachers. This was accomplished through "Operation Classroom", a cooperative project designed to test the effectiveness of television as a supplement to classroom teaching during school hours.

This pioneer experiment, the first long-range school television project aimed to reach all grade levels, has already attracted nationwide attention, and we are receiving inquiries as to how other communities can start their own "Operation Classroom". There is no standard formula that can be applied everywhere, because much depends on local factors. Nevertheless, the story of what has happened in the Philadelphia area may well serve to stimulate and guide others in the same direction.

Any successful operation begins with cooperation and is carried through by more of the same. In Philadelphia the commercial broadcasting stations had a well-established policy of cooperation with the school system in presenting programs of an educational nature, first on AM radio and more recently on television. There was, however, a serious obstacle in the way of scheduling television programs for in-school viewing, namely, that hardly any schools were equipped with receivers. While this condition prevailed, the stations could scarcely be expected to undertake the expense of preparing special school programs, and the schools had no inducement to acquire sets as long as there no were programs especially designed and scheduled for them. Obviously, it was necessary for a third party to step in and break this deadlock.

### *Works Closely With Schools*

The Educational Division of RCA Victor, for its part, had long been working closely with the schools to encourage and develop every phase of audio-visual education. It was natural, therefore, that we should offer our cooperation in making available a certain number of television receivers, on an experimental loan basis, to schools in Philadelphia, in Camden, and the suburban area. Thirty-one RCA Victor table-model television receivers were made available for this purpose, and the schools in which they were to be installed were selected by school authorities. Two sets were placed in each of the seven public school districts of Philadelphia (one in an elementary school and one in a junior high school), six sets in Camden public schools, eight sets in Catholic parochial schools in Philadelphia and Camden, and the remainder in adjacent townships.

With the installation of sets assured, the planning of a well-rounded program schedule was un-

dertaken by representatives of the school systems in consultation with personnel of the Philadelphia *Bulletin's* television station WCAU-TV, which agreed to enter the project as a public service to the community. Miss Martha A. Gable, of the Philadelphia public schools, and Miss Margaret Kearney, of the Philadelphia diocesan schools, working together with Mrs. Ruth Weir Miller, educational director of Station WCAU, devised a series of four weekly telecasts designed to reach all grade levels from primary to senior high. As a result, early last March, "Operation Classroom" (as the experimental project was called) went into action.

### *Four Programs Telecast Weekly*

The four weekly school programs were broadcast on the following schedule: Mondays at 3:00 P.M. for primary grades 1 to 3, Wednesdays at the same hour for intermediate elementary grades 4 to 6, Thursdays for junior and senior high schools (1:00 to 1:30 P.M.), Fridays at 1:00 P.M. for junior high school students. The Thursday program was the televised version of a vocational guidance series known as "Career Forum" that had long proved successful on radio.

Programs for primary grades included such topics as "Music Through Rhythm", "We Learn to Read", "Your Books Come to Life" (dramatization of favorite children's books), and "A Visit to Storyland" (China). Youngsters in grades four to six witnessed programs dealing with social studies ("We Visit Italy"), art ("Costumes 'Round the World"), music ("Let's Make Musical Instruments"), and science ("What Makes Weather"). Designed for junior high school students were telecasts on such subjects as city planning, transportation, art and architecture, and social studies. Teachers, pupils, and outstanding leaders in various fields took part in the programs.

Detailed evaluation sheets and questionnaires were sent to all schools participating in the project, to be filled in by the teachers who actually used the programs. Of those who replied, ninety-eight percent agreed that television was an effective and valuable teaching aid. In some schools, the pupils were also invited to write down their comments. This typical comment came from a fourth grade youngster: "I think the telecasts were fine. I liked them because they taught me things I wanted to know".

Yes, television not only teaches children the things they want to know, but also teaches them in a way that holds their interest and that causes the knowledge to remain in their minds. In the words of Ruth Weir Miller, "If the objective of teaching is the acquisition of concepts, then television is the most dynamic tool the teacher has ever had at her command." Of course, television cannot take the place of the teacher; its full effectiveness will always depend on how effectively the teacher uses it.

### *Local TV Stations Cooperate*

On April 22nd, Station WFIL-TV, the Philadelphia *Inquirer's* television outlet, began two series of school telecasts, scheduled in successive periods on Friday afternoons. One of these was a series on civics, titled "Government in Action", designed for junior high school students and dealing chiefly with municipal administration. The other series, directed to elementary schools, dealt with health and fitness and was called "Fit as a Fiddle".

The third television station in Philadelphia, Station WPTZ, also made a notable contribution to in-school television with a special series of three weekly programs, beginning in March, designed for viewing by high school students in public, parochial and private schools. Thanks to the public-spirited activity of the local stations, as many as nine telecasts were made available in one week to schools in Philadelphia and its suburbs. This undoubtedly constitutes some kind of a record.

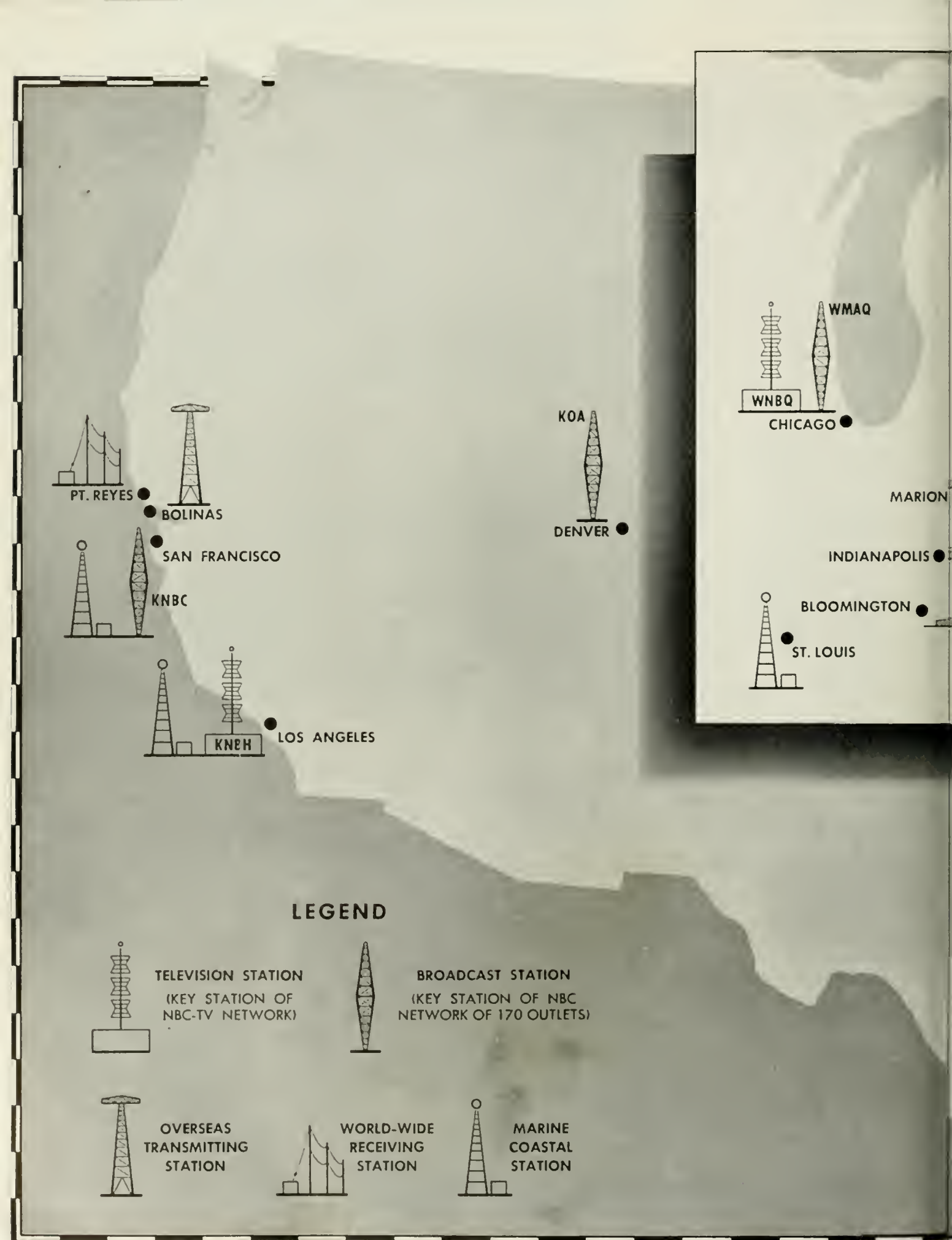
Many institutions, agencies, and industries contributed to the success of the programs by making available specialized personnel for interviews and demonstrations and by lending equipment and materials to be placed before the television camera. Among such agencies and institutions were The Franklin Institute, the City Planning Commission, the Philadelphia City Council, the Pennsylvania Railroad, the Philadelphia Zoo, the Police Department, the Department of Sanitation, etc. Once again, this stresses the all-important factor of cooperation, and emphasizes television's ability to bring the outside world into the classroom.

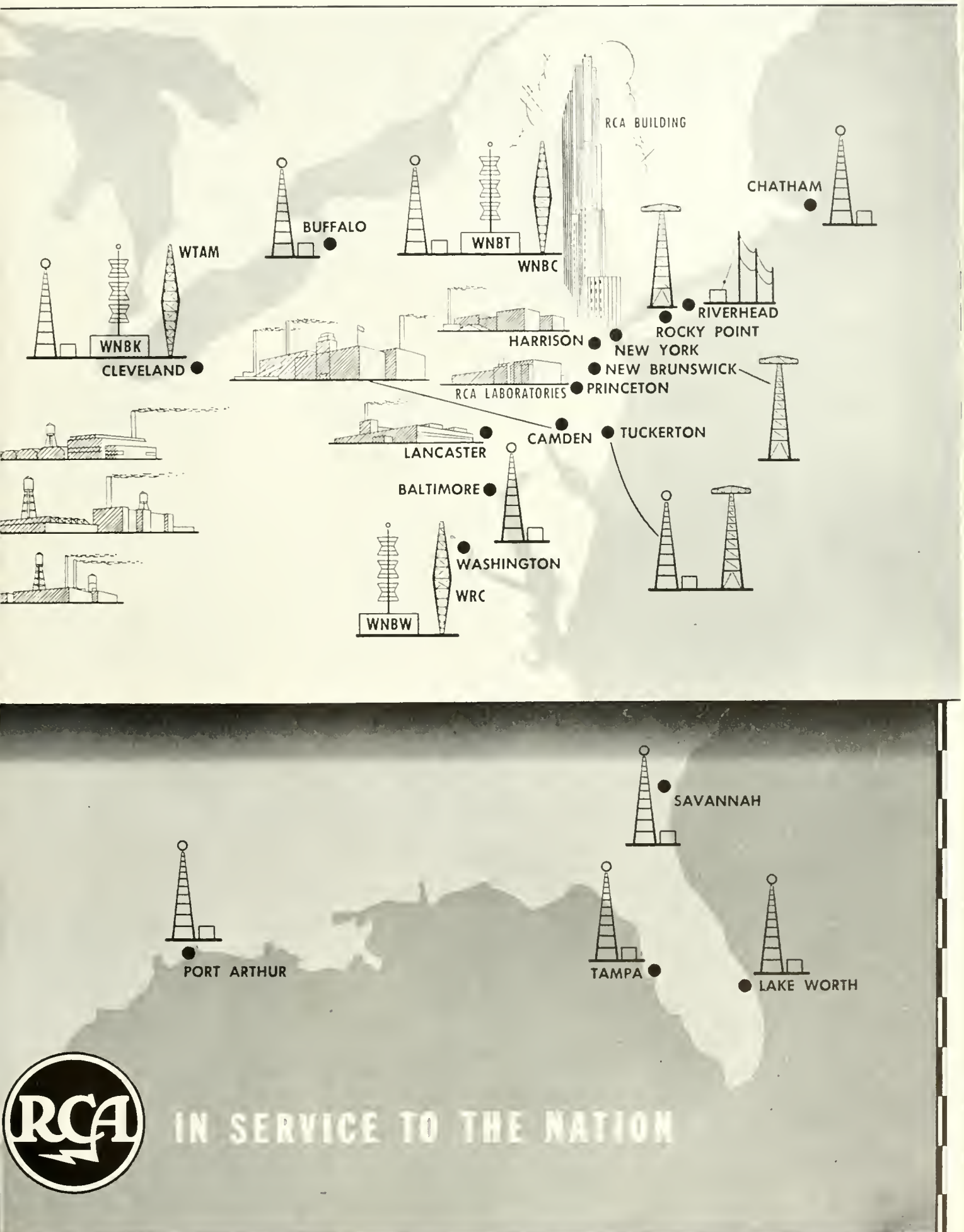
### *Adults Enjoy Classroom TV*

Telecasts designed for in-school reception are not necessarily limited in their appeal to pupils and teachers. As a little girl in the fourth grade of the Edmunds School wrote, "My Grandmother also looked at 'Operation Classroom'. She liked it too."

RCA Victor dealers and distributors in many television centers throughout the country have shown a keen interest in "Operation Classroom", and undoubtedly will help to stimulate similar activity in other cities. In this area it is planned to expand the project for the next school year, with the cooperation of local RCA Victor dealers and of the Raymond Rosen Company, RCA Victor distributor in Philadelphia.

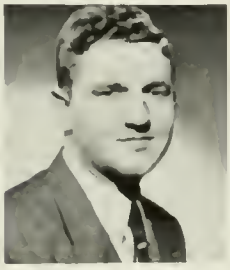
STUDENTS BECOME ACTORS IN A TELEVISION DRAMA DEPICTING THE CUSTOMS OF A FOREIGN COUNTRY, ONE OF THE EDUCATIONAL PROGRAMS IN "OPERATION CLASSROOM."





# Trains Employees for Careers

*NBC Conducts Extensive Courses to Develop Personnel for Executive Positions in Radio and Television*



By Ernest de la Ossa

*Director of Personnel*
*National Broadcasting Company*

AS the pioneer in broadcast network operations, the National Broadcasting Company, since its formation in 1926, has been the goal of thousands of young people seeking opportunities in a fast-moving industry dedicated to public service.

Actually, radio's appeal to the career seeker is many-sided. The business moves ahead rapidly; it has the glamour of novelty continually renewed, and through deeds, it has acquired a well-deserved position as a medium of service to the masses.

Young applicants for employments are aware of this three-way keynote of newness, accomplishment and service. At the same time, these attributes demand of neophytes a mature outlook at an early business age and a willingness to give unstintedly of their labor.

It is not surprising, therefore, that the question I am asked most frequently is this: "What does NBC look for primarily when interviewing applicants?" The answer involves several basic points. Does the applicant exhibit a sincerity of purpose, a willingness to work hard, and the potential capacity to develop himself in the highly competitive atmosphere of the broadcasting field? Does he possess a tempered imagination and a natural creativeness; does he have a sense of social responsibility? Lest I give the impression that NBC's Personnel Staff has a mystical power of analysis, let me say here that all of these desirable factors in a prospective employee cannot always be determined in an interview. In fact, some are not developed until the newcomer has been at his assigned task for some time.

That is why NBC has established a system of training and job analysis to observe the progress that young employees make within the Company. This constant but friendly scrutiny is essential if NBC is to build a reservoir of personnel in all branches—administrative, executive and creative—to meet the challenges of an ever-changing business.

The scope of NBC's training activities ranges from orientation programs to those of supervisory training and executive development.

All new employees are given a five-hour orientation course during the first week of their employment to acquaint them with the history of the Company, its overall organization and its operational and personnel policies.

Young men and women employed in such positions as guides, pages, messengers, stenographers, clerks and other junior classifications are selected for a variety of formal training to better prepare them for promotion to higher operating positions. Announcing classes, information lectures and discussions with Management representatives and Department Heads on Company operations and job opportunities, and on-the-job assignments in operating departments are provided for those employees who possess the necessary qualifications for advancement to positions of higher responsibility.

### *Qualified Employees Trained*

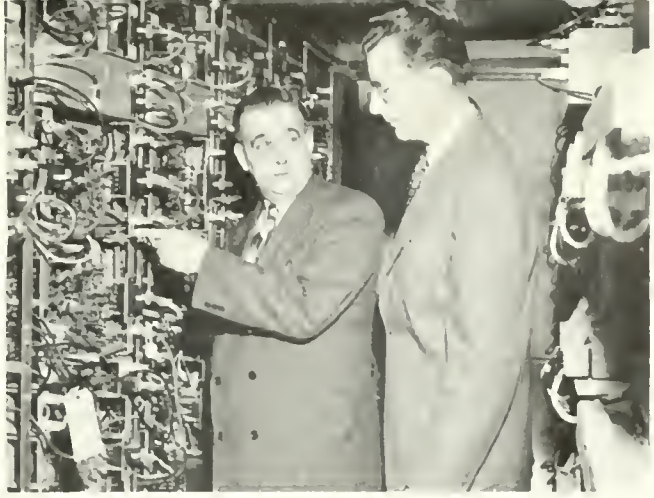
A group of top qualified young college graduates is engaged for assignment to the NBC Executive Training Squad. These young men are assigned to specific on-the-job training for a period of 12 to 18 months based on a pre-planned program assigning them to all phases of operations related to one of the following four Company activities: 1) Sound Program; 2) Finance and Services; 3) Sales; 4) Television. At the end of the formal training period, trainees are assigned to key junior administrative positions.

Technical training plays an important part in NBC's training program. Young men from technical schools and colleges are engaged for training in Television and Sound Engineering operations. The training consists of both classroom and on-the-job instructions enabling the trainee to gain practical knowledge of the technical plant and all phases of engineering operations. Refresher courses for senior engineers are also conducted to assist these employees in keeping up with technical advances and changes in Company technical operating procedures.

So that employees at all levels of operations may have the opportunity to keep up-to-date on Company operations and organization, a

NBC PERSONNEL MANAGER TED THOMPSON CONDUCTS A SESSION OF THE NETWORK'S JUNIOR EXECUTIVE TRAINING GROUP.

WHITNEY BASTON, DIRECTOR OF ENGINEERING TRAINING, EXPLAINS THE OPERATION OF A CONTROL BOARD TO NBC TRAINEES.



SUPERVISOR GEORGE GRAHAM OF TELEVISION ENGINEERING TRAINING POINTS OUT THE DETAILS OF A VIDEO CIRCUIT TO A STUDENT TECHNICIAN.

series of all-employee information meetings and panel discussions is scheduled periodically throughout the year. Department Directors and Managers discuss their organization and operations and point out the part that their functions play in the overall operations and objectives of the Company. The most recent series of this type, running for a period of eight weeks, was devoted to discussions of all phases of NBC's television operations.

Supervisory training is an integral part of NBC's training activities. Supervisors in all departments meet regularly each month to discuss supervisory problems relating to job instruction, job relations and human engineering.

At the Management and staff level a program of executive development is carried on continually. At this level training is offered for the most part on an individual basis. Training timetables are established for key personnel to insure that the employee will be afforded every opportunity to develop his ability and qualifications to assume higher executive assignments.

### *Many Opportunities in Radio*

In discussing the advantages of employment in any industry there can be no better proof of the opportunities existing than a mention of individuals who have made notable successes of their chosen vocations. During the past 23 years, thousands of young men and women have been employed by NBC as pages and guides. Their duty is to meet and greet the millions of NBC guests and escort them through broadcasting and television operations. Today, the roll of nearly every department of the National Broadcasting Company reveals numerous executive or creative specialists who have risen from the ranks after putting in a period of training and indoctrination as pages. Paul Rittenhouse, manager of the Guest Relations Department; Theodore Thompson, personnel manager; Tom McFadden, manager of stations WNBC, WNBC-FM and WNBT, and William Garden, now a television program producer, launched their careers in this manner. John Tiedeman, budget officer of the Company, and George Wallace, manager of Network Sales Promotion, also once wore the uniform of NBC guides. Numerous others have advanced to responsible positions outside the Company; many have even developed into noted artists of the networks.

It should be understood, however, that not all jobs in broadcasting are bathed in glamour. NBC also has a large staff working behind the scenes but equally essential to the smooth-operating team that has created the nation's Number One Network. Included are messengers, operators of duplicating and mimeograph machines, typists, clerks, and a wide variety of other people whose occupations are indispensable in the conduct of any large corporation.

### *Television Opened New Doors*

The advent of modern television in late 1946 opened many new opportunities for those with the special qualifications inherent to the video field. Television, like radio, must depend heavily upon young people, but the problems and challenges of the new medium demand workers with imagination and a readiness to accept responsibilities.

Not long ago, Mr. Niles Trammell, NBC President, who started his Company career as a member of its sales staff, summarized the radio employment situation in this succinct paragraph:

"We want enthusiasm and zest in our business, but the basic essential is the type of dependable skill and judgment that is characteristic of the professional in any line of endeavor. The 'pro' may not be brilliant but his day-in, day-out performance is absolutely reliable. The key jobs in broadcasting go to the people who have professional competence and reliability."

## "KUKLA" NAMED BEST TELEVISION PROGRAM

"Kukla, Fran and Ollie" recently was honored by the Chicago Federated Advertising Clubs as "the best television program of any kind produced in Chicago". Burr Tillstrom, creator and impresario of the program which is sponsored on 32 stations of the NBC Television Network by RCA Victor Division, accepted the award.

This is the second successive year that "Kukla, Fran and Ollie", has received this tribute, the third won by the show in recent months. Previously, it was given the citation of merit of the Illinois Federation of Women's Clubs, and an award at the 19th Institute for Education by Radio at Ohio State University.

# Television Outlook is Bright

*In Address to Stockholders at 30th Annual Meeting of Corporation, General Sarnoff Says Television is Safeguard Against a Serious Economic Recession — Chairman of Board Reveals 1948 as Most Successful Year in RCA History*

TELEVISION, continually growing in popularity as a new service and industry, is becoming a vital factor in the Nation's economy, Brigadier General David Sarnoff, Chairman of the Board of the Radio Corporation of America, reported at the 30th Annual Meeting of RCA stockholders held May 3 in a studio of the National Broadcasting Company at Radio City. He said that television is "one of the safeguards against a serious economic recession".

Pointing out that the impact of war and the subsequent reconversion period created an unusual situation, General Sarnoff said: "In the return to more normal business conditions, where the law of supply and demand again is in operation, and to a buyer's market in which competition is keener—it is clear that 1949 will be a more difficult year than 1948."

Net profit, after taxes, of RCA for the first quarter of 1949, he reported, was $5,932,083, an increase of $167,585, compared with the same period in 1948. Profit for the first quarter of 1949—before Federal Income Taxes—amounted to $9,804,083, compared with $9,631,498 in 1948.

Earnings per common share for the first quarter of this year amounted to 37.1 cents, as compared with 35.8 cents per common share for the first quarter in 1948.

Consolidated gross income of RCA during the first quarter of 1949 amounted to $92,327,827, compared with $88,053,297 for the same period last year. This represents an increase of $4,274,530 over the 1948 figure.

General Sarnoff reported that during the past ten years RCA has paid more than $65,000,000 or 53 per cent of net profits, in dividends to its stockholders. Of this amount, $31,820,000 was paid to holders of preferred stock and $33,254,000 was paid on the common stock. He said that during the same ten-year period the net worth of the Corporation was increased by $60,000,000, and now exceeds $127,000,000.

### *Most Successful Year of RCA*

The year 1948, he recalled, was the most successful in the history of the Corporation—either during peace or war. Volume of business was higher, profits earned were larger, and dividends paid to stockholders were greater than any other year since RCA was founded in 1919.

On May 1 of this year, RCA personnel numbered more than 41,000, he said, praising the loyalty and spirit of cooperation given to the Corporation by employees.

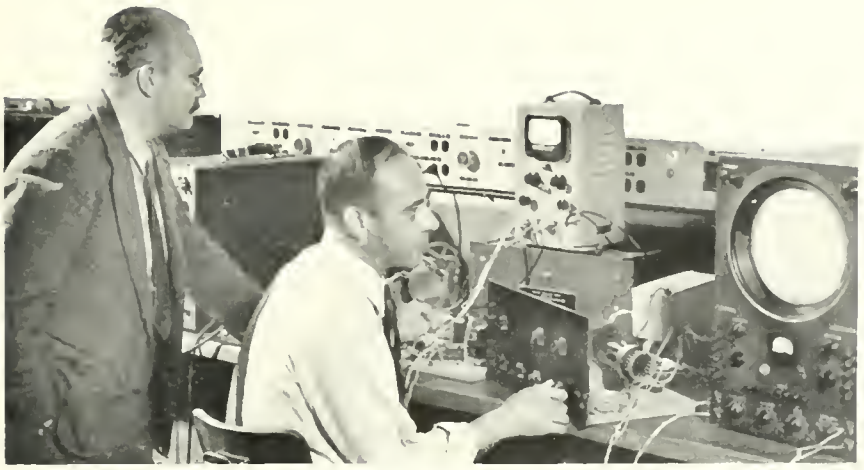
"It is gratifying to report that there were no strikes in RCA during the past year," declared General Sarnoff. "Labor problems that arose from time to time were solved through collective bargaining with the forty-three unions representing our workers."

Reviewing current operations of RCA, which include research, engineering, manufacturing, broadcasting and world-wide communications, General Sarnoff discussed some of the problems for which RCA is seeking solutions.

"First," he said, "let us consider television. Here is a new art and industry, which must be developed within the framework of governmental regulation as to technical standards, number of stations that can be owned by any one company, and other matters. The growth of television today and tomorrow is not dependent merely upon manufacturing and selling transmitters and receivers. Many regulations control its advance and, while directed chiefly at the transmitting end, they also affect the receiving end.

"In recent months, you doubtless have read some of the dire predictions about quick obsolescence of television receivers. Many facts have been omitted. No one need hesitate to buy a present-day type of television receiver, for there is no indication that receivers of 1949 design will be obsolete in the near future. It is interesting to note that RCA Victor television receivers, first introduced to the public

PRODUCTION LINES OF METAL-CONE AND ALL-GLASS TELEVISION PICTURE TUBES AT RCA'S LANCASTER, PA., PLANT.



"SCIENTIFIC RESEARCH IS AS VITAL A FUNCTION IN THE RCA AS IS MANUFACTURING OR BROADCASTING."

OPERA STAR GLADYS SWARTHOUT COMPARES THE 12-INCH, 78-RPM RECORD WITH THE NEW 7-INCH, 45-RPM DISC.

in 1939, are still in use and giving satisfaction, although more than ten years have passed.

"Television is too powerful a force for the public good to be stopped by misleading propaganda. No one can retard its advance any more than the carriage maker could stop the automobile, the cable, the wireless, or the silent picture the talkies. Television is something the public has long desired and is eager to have. It is here to stay, because the people like television and want it."

### *Audience Cooperation Needed*

General Sarnoff urged patience on the part of the public while showmen and performers develop improved techniques, declaring that only through the cooperation of the audience will the showmen know what to provide in entertainment, news and education.

"Ultimately the success of television will rest primarily on programming," he declared. "Television is a new force in communications, and it is also a remarkable new art form. As such it is fraught with problems and requires experimentation, both scientific and artistic, to determine the direction of progress that will satisfy the public.

"We in RCA—now, as in the past—gladly abide by the public's decision, for we have found public opinion to be essential in charting the future of an invention, an industry, or an art. This is in keeping with the character of a country that enjoys freedom to invent, freedom to compete, freedom to think, and freedom to criticize. . . .

"The outlook for television in 1949 is bright. It is continually gaining in popularity with the public, and as a new industry, it is one of the safeguards against a serious economic recession for it promises to be a vital factor in the Nation's economy.

"The radio industry is particularly fortunate in being closely allied with science and invention. This alliance always holds the promise of new products and new services. Scientific research is as vital a function in the RCA as is manufacturing or broadcasting. Radio has been, and will continue to be, a broad field for new developments and expansion. Even in this day of television, we believe that we are only on the threshold, for radio is still a fertile field for invention, discovery and progress.

"We have seen radio broadcasting, talkies, television, radar, Ultrafax and the new field of electronics evolve from the small beginnings of the early wireless."

Recalling RCA Victor's pioneering and world leadership in recorded music, General Sarnoff praised the development of the new 45-rpm phonograph system which RCA Victor recently introduced to the public. He said that the new system solved problems as old as the industry itself and presented new standards of value and performance, unmatched by any other record or record player available to the public.

General Sarnoff declared that broadcasting had been immensely widened in scope by the addition of television, and that expansion of operations in this field is going forward under the auspices of the National Broadcasting Company, a service of RCA.

### *Sound Operations Essential*

"How well and how soundly such operations are conducted are of interest not only to our stockholders, but also to the public, to the affiliated stations and to advertising sponsors," he stated. "Doubtless you have been reading of recent 'talent raids' on NBC. We could have matched the millions involved in such skyrocket bidding had we been indifferent to the interests of our stockholders, artists and clients.

"We believe time will show there is no profit to the network, the sponsor or the artist in the purchase of over-priced talent packages. Commercial program costs must be measured by what radio is able to deliver to advertising sponsors. According to recent trade reports, some of the so-called 'assets' purchased in these talent raids already are dwindling.

"Leadership built over the years on a foundation of solid service cannot be snatched over-night by buying a few high-priced comedians. Leadership is not a laughing matter.

"Broadcasting faces no easy task during this conversion period for each new step presents an economic problem of its own. The policy of the National Broadcasting Company has been and continues to be to provide the highest variety of entertainment and the best informational, cultural and educational programs.

"At the same time, we seek to maintain program costs at an economic level that will pay off to the advertiser, the affiliated station and the network. This means the constant production and addition of new, high quality, dynamic programs, the encouragement of new talent, new program ideas, and new personalities. In all these respects your Company intends to lead, not to trail, competition."

### *Future Rests on World Scale*

In looking ahead, General Sarnoff said that the future should be weighed on more than a domestic scale since the world had been made much smaller and more compact by science and because all people, regardless of boundaries and man-made "curtains," live closer together than ever before.

"I have recently been in Europe," he asserted, "and I can assure you that any serious setback in American economy would have grave repercussions overseas. While I do not foresee any major economic depression in the United States, I believe that we should expect some adjustment in business conditions.

"The pace of the past ten years, under the impact of war and the conversion to postwar industrial activities, has been swift. We must now take up the slack and readjust our sights in planning for the future.

"The unusual conditions that prevailed in the postwar years, including 1948, brought many new problems to business and their solutions opened new opportunities. We have made every effort to embrace these opportunities to strengthen the Corporation and to apply them in charting the future. With civilian production curtailed during the war, it was natural that there was a large backlog of consumer demand. Our efforts to fill these needs are reflected in our high volume of business and profits in 1948."

General Sarnoff said the strength of RCA is found in its scientific research and diversification and reported to stockholders that although from time to time one unit or another of the RCA organization has been up or down, according to the exigencies of the times, the consolidated picture has consistently shown earnings commensurate with progress.

He said that from time to time voices had been raised against ownership of broadcasting stations and manufacturing plants by the same organization, but declared that practical proof of the value of this ownership to the nation, to the public and to the industry, now is being witnessed.

### *Enterprise Hastened Television*

"For instance," he said, "if the National Broadcasting Company had not gone on the air with television stations and programs before manufacturing of television sets got under way on a mass production basis, television might never have been started.

"Certainly the growth of television would have been retarded and the pleasures derived by the public from television would have been delayed. As the broadcasting business is being readjusted to conform with new patterns dictated by the addition of sight to sound, it is quite clear for all to see that diversification is a sinew of industrial strength."

In conclusion, General Sarnoff declared that the Directors and management of RCA are fully aware of the new and complex problems that lie ahead, and added:

"These problems are inherent in the establishment of a new industry. And television is not just something added to broadcasting. It is a new industry calling for development of a new art form and for new conceptions in entertainment as well as in equipment. While these problems present great challenges, they also present great opportunities for progress. Therefore, we look forward to the future with confidence."

JOSÉ FERRER, STAGE STAR, PORTRAYS THE TITLE ROLE IN TELEVISION VERSION OF "CYRANO DE BERGERAC."


TELEVISION HAS DEVELOPED ITS OWN TECHNIQUE FOR THE DISSEMINATION OF NEWS FROM AROUND THE WORLD.

INFORMATIONAL AND EDUCATIONAL FEATURES COMPRISE AN IMPORTANT SEGMENT OF VIDEO PROGRAMMING.

# RCA Institutes Holds Graduation

*Class of 163 Students Hears General Sarnoff Outline Opportunities in Electronics Field*

RADIO, television and electronics provide a vast field of opportunity for young Americans alert to clues that lead to discoveries and inventions, Brig. General David Sarnoff, Chairman of the Board of the Radio Corporation of America, told members of the graduating class of RCA Institutes at commencement exercises held May 26, in an NBC studio at Radio City.

Graduates of the Institutes, which is the oldest radio technical training center in the United States, numbered 163 at this year's commencement. They included young men having completed courses in radio servicing, operating and broadcasting, and advanced technology covering maintenance, operation and development of circuits and equipment in both radio and television. A welcoming address was given by Maj. General George L. Van Deusen; the invocation was by the Rev. Dr. Ralph Thorn, of the Willis Avenue Methodist Church, the Bronx.

"The science of electronics serves the people and industry in many ways," declared General Sarnoff. "The full extent of its usefulness has yet to be measured. We think of electronics first and foremost as the heart of modern communications. Through its magic, we can transmit messages and music around the earth — and eventually television also will encircle the globe.

"Already news as it happens and history as it is made are seen by many millions of Americans. There are 1,300,000 homes in the United States equipped with television. In comparison, 39 million homes have radio sets, and in the years ahead most if not all of these radio-equipped homes will have television.

"Therefore, as television spreads across the Nation, opportunities in manufacturing, installation and servicing will expand. Industrial and theatre television are big fields that are beginning to open. These, broadly stated, are the most obvious services of this great science with which you, through your education, have formed a professional alliance."

General Sarnoff told the graduates that in addition to radio and television, the science of electronics provides many other opportunities.

"We live in an era of high-speed transportation and communication," he continued. "Only recently, we have developed tremendous and potentially dangerous sources of power. It is electronics, which has duplicated and even surpassed human performance in many ways, that gives us that precise degree of control so necessary to these technological advances. Indeed, we may well think of this as a century not only of great speed and great power, but also one of master controls."

He said that in the industrial field great mills, which can turn out a mile of cold-rolled steel in a minute, have their rollers synchronized perfectly by electronics, as do many other plants owing their production capabilities to electronic regulators, heating devices and other electronic apparatus.

Electronics have helped to smash numerous industrial bottlenecks, he reported, recalling that electronic power computers made possible a seven-fold increase in aluminum production in World War II.

### *Electronics Speeded Tools of War*

"Electronic devices have sharpened all five human senses," asserted General Sarnoff. "With one, we can hear a fly walking. And there is a phototube so sensitive it distinguishes more shades of color than the eye. Another device feels variations of one ten-thousandth of an inch in thickness of a copper wire; still another will taste a drop of vinegar in a vat of water; and one electronic instrument can smell the smoke of a match inside a giant warehouse.

"We can watch an electronic circuit measure the speed of bullets whizzing from a gun. Other instruments probe electronic fingers deep into the earth and unerringly locate hidden oil and ore deposits. Similarly, they can detect impurities in sealed packages and bottles."

BRIG. GENERAL DAVID SARNOFF PRESENTS A DIPLOMA TO ONE OF THE GRADUATES OF RCA INSTITUTES AT EXERCISES HELD IN AN NBC STUDIO ON MAY 26.

He reported the development of electronic computers having the ability to "out-speed the human brain," working out in a fraction of a second problems that would take mathematicians hours or even days to solve. He told of a tube called the Selectron which, he said, can remember 256 items of information and can release any part of it to supply an answer to a problem in less than a millionth of a second.

"Because of their inherent capabilities and versatility," said General Sarnoff, "radio and electronics deserve our utmost attention in finding or devising new tasks for them. For a number of years, we have been working to reduce the size of personal radios, and with some success. As a result there are instruments about the size of a jewel box that operate very satisfactorily.

### *Envisages Tiny Television Set*

"But why stop there? How about a radio the size of a wrist watch? About a year ago, a Swiss firm introduced a wrist watch containing a buzzer alarm. If the Swiss can devise an alarm clock to wear on the wrist, I believe that Americans

*(Continued on page 31)*

# Honorary Degrees to Folsom and Engstrom

FRANK M. FOLSOM

FRANK M. FOLSOM, President of the Radio Corporation of America, received honorary degrees of Doctor of Laws from Fordham University and Manhattan College, New York, during Commencement Exercises held at the two institutions on June 9 and 14 respectively.

The citation accompanying Mr. Folsom's degree at Fordham read as follows:

FRANK MARION FOLSOM — The distinguished president of the Radio Corporation of America, awarded the Presidential Medal in recognition of his continued and outstanding services to our country in administering a multiplicity of high offices throughout the war years, recipient of the Distinguished Civilian Award, the Navy's coveted honor. His American ancestry dates to the early seventeenth-century waves of colonists to our shores. The record of his name in the rolls of our country's patriots entitles him to membership in the Sons of the Revolution. For two decades he has executed top-level posts not only in the largest business of the world—our Government—but also in half a dozen leading corporations. He simultaneously holds directorships in numerous companies and he is a regent or councilor or trustee in many institutions of higher learning throughout the United States. For his work and his achievements in favor of the church he holds the papal honor of Roman Knight in the Sovereign Military Order of Malta. In celebration of his great personal accomplishments and to add our tribute to his other honors, he is presented for our most glorious decoration, the honorary degree of Doctor of Laws.

At Manhattan College, the following tribute preceded the award of the degree to Mr. Folsom:

The family name borne by this distinguished gentleman, Frank Marion Folsom, has been a bright and honored light, from the very beginning, in the history of New England. In the business world of management and production that honorable name rings as a synonym for hard work, for untiring perseverance, for absolute honesty linked with high gifts of mind and heart. Today this distinguished gentleman holds the lofty position of President of the Radio Corporation of America. He has been besides, the recipient of the highest honors of Church and State in recognition of notable services rendered to both.

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Elmer W. Engstrom, vice president of the Radio Corporation of America in charge of research at RCA Laboratories, was awarded the honorary degree of Doctor of Laws at the Commencement Exercises of New York University on June 15.

Brig. General David Sarnoff, Chairman of the Board of RCA and a member of the University's Governing Board, escorted Mr. Engstrom to the speaker's platform where Chancellor Harry Woodburn Chase conferred the degree with this citation:

ELMER W. ENGSTROM

ELMER WILLIAM ENGSTROM—A native of Minnesota and an engineering graduate of the University of that state, his personal contributions as a research engineer to radio and electronic development, and notably to the incredible progress of television, command the forthright respect of his scientific peers. Vice president in charge of research of the Radio Corporation of America, he is one of that exclusive group of latter-day Prometheans who not only illumines with his own brilliance, but who yokes the genius of fellow Titans unrenowned for tractability into corporate resourcefulness and fecundity. President of the Industrial Research Institute, he is concerned moreover with the constant improvement of research activity throughout American industry as a buttress to our common wealth. In his residential community at the grass roots level he has no less proved himself the good citizen in various roles of civic leadership. For all of which, with unconscionable gusto, we would envelop him with the bondage of our honorary doctorate of Science.

# DESIGNING EXPORT RADIOS

*Purchasers of Receivers Abroad Demand Quality, Durability and Attractive Appearance in the Products They Buy*

By John Vassos

*Industrial Designer*
*Consultant to*
*RCA International Division*

IF we could learn to apply to our own lives the simplicity and truth which we have learned to incorporate in our export radios, we would be much happier—and have fewer nervous breakdowns.

My export assignment for RCA calls for pure designing—absolute truth. The export market demands complete honesty of line, and lasting simplicity.

In Europe, in Latin America, and in the other countries abroad, the purchase of a radio is a serious business. The prospective buyer wants the full value of his dollar. He wants a quality set, as it may have to last him as much as ten years. And therefore he wants a design which will be harmonious with the furnishings of his house during that time. A radio is an important part of his living-room, but it must not be pretentious.

With these needs in view, in 1936 I designed for RCA a radio whose pattern has been followed ever since in the Company's models. The top-heavy, "tombstone" style which had been used up to that time was discarded, in favor of a longer, lower chassis to blend with the room.

I felt that we should keep only the two basic areas of interest—aural, the mechanism which produces sound; and visual, the knobs, dial and cabinet which allow the sound to come out. These two elements dictated the form of the instrument. It was to be a simple statement expressing the medium. All extraneous features which were in contrast to this statement, such as the legs and over-ornamentation, were rejected.

We adapted the American principle of streamlining to radio design. The Americans, I believe, have always had the greatest feeling for simplicity of line. We have been the first to apply it in our design of airplanes and in our architecture. It has been one of the factors in bringing American standards to the top. Yet the appreciation of this simple styling in radios is found to a much greater extent abroad.

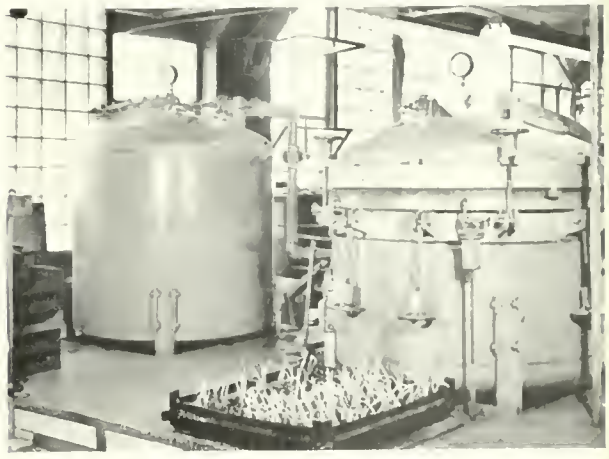
The mechanical features of an export radio require much special attention. The value of a set is determined largely by the number of bands it covers, for in many export markets, short-wave stations are of prime importance. Moreover, we must provide the best in sensitivity and selectivity.

The materials used must be extremely durable to stand up under the rigors of rough handling in shipment, and of extremes of climate: cloth that won't sag, glue that won't melt, wood so dry that it will not absorb moisture. These are "musts" for every radio.

Another contributing factor in export radio design are the import regulations of various countries. Duties are imposed in proportion to weight and size as well as on an ad valorem basis. This consideration particularly affects the radio-phonograph combinations.

Fortunately, in all our problems of design we have the whole knowledge and experience of the many RCA branches to draw on—the RCA Laboratories, the RCA Victor Division, RCA Communications, Radiomarine Corporation of America, and the National Broadcasting Company. At the other end is the world-wide organization of distributors and dealers of the RCA International Division to put these quality receivers in the customers' homes.

IN THIS CONTROL LABORATORY GLUES AND LACQUERS ARE CHECKED FOR THEIR RESISTANCE TO TROPICAL CONDITIONS.



PARTS FOR EXPORT RECEIVERS ARE IMPREGNATED WITH LIQUIDS IN THESE VACUUM TANKS TO PREVENT DETERIORATION IN HUMID CLIMATES.

REMOVING AN RCA EXPORT RADIO SET FROM A "TORTURE CHAMBER" WHERE IT HAS BEEN SUBMITTED TO CONDITIONS MORE SEVERE THAN WOULD BE ENCOUNTERED IN THE TROPICS.

# THE RCA EXHIBITION HALL

*Radio, Television, and Electronic Displays Attract 2,500,000 Persons in Two Years — Hall's Facilities, Including Theatre, Used by 1,000 Outside Organizations*

TO a majority of the two and a half million people who have visited the RCA Exhibition Hall, in New York, since its opening in May, 1947, it is a wonderland of radio, television and electronic progress. There, in Radio City, behind windows 200-feet long and two stories high, RCA products are colorfully displayed and its services portrayed by animated exhibits. On the concourse level, below the street, a theatre seating 75 people, a guest lounge, several reception rooms, offices and a completely-equipped engineering shop make up an important part of the Hall which the average tourist does not see.

One of New York's leading tourist attractions, the Hall is a fascinating spot where the visitor may see himself televised, name his favorite record and hear it played back, operate the latest model RCA Victor radios, phonographs and television receivers, or investigate the marvels of radar, loran, the direction-finder, and radiotelephone units — all of which play an important part in maintaining safety at sea.

By merely pushing the button of his choice, the gadget enthusiast sees the NBC station nearest his home town light up on a huge glass map, hears the current network broadcast or sees the latest telecast. Another button brings into view several tiny, rotating wood carvings which depict the highlights of NBC history. A large global relief map, on which the routes of RCA radiograms may be traced by neon-lit paths, is among the most popular attractions, and few visitors leave without taking with them souvenir messages from the radio-teletype machines.

This combination of education and entertainment never fails to intrigue guests in every age group. Youngsters are delighted with the self-operation gadgets; students of radio and electronics probe the mechanical side of the instruments; while the older folk never cease to marvel at the display of scientific progress.

Though not included in every visitor's tour, the Johnny Victor Theatre and private meeting rooms on the concourse level also play an important part in Exhibition Hall functions. Here, beyond the view of the casual spectator, conferences are held, films screened, cocktail parties given, demonstrations staged, and classes conducted. Television and radio programs also originate from the Exhibition Hall.

### *Outside Organizations Use Hall*

Although it operates primarily to serve the Radio Corporation of America, the Hall's facilities have been made available to more than one thousand outside organizations. It has become a favorite meeting place for philanthropic organizations, business, scientific and educational groups, and other associations having a public service to perform. The popularity of the theatre and lounges is evidenced by the fact that bookings frequently must be made two months in advance.

The Johnny Victor Theatre is a modern, compact, comfortable studio, constructed with finest acoustics for musical concerts, a glass-enclosed control room, and an up-to-date projection room for screening films. Large-screen television demonstrations on a 6- by 8-foot screen have been staged here frequently, and the broadcast programs, "Author Meets the Critic" and "Much Ado About Music" originate on the theatre's stage. On several occasions video programs have been telecast from this spot, using the full line of TV equipment which is part of the theatre's permanent facilities.

Television monitoring and control equipment, panel boards, and turntables for disc-playback to the upper level are found in the control room. Adjacent to the theatre a record library of over 10,000 selections is maintained.

Adjoining the Johnny Victor Theatre, the attractive and spacious Public Lounge is in constant demand both by RCA Divisions and outside groups. This room and the smaller, Executive Lounge, are the scenes of a wide variety of public relations activities, while the "Salle Petite" is used exclusively for private interviews.

In these attractive surroundings, RCA introduces its new products and developments to the public and the press. For example, the 45-rpm records and record players, and the new RCA Victor television receivers equipped with 16-inch metal-cone kinescopes were first revealed and extensively demonstrated here.

THE JOHNNY VICTOR THEATRE OF THE EXHIBITION HALL IS USED FREQUENTLY FOR THE PRODUCTION OF NETWORK BROADCASTS.

FEATURES OF THE EXHIBITION HALL HAVE BEEN WITNESSED BY TELEVISION VIEWERS AS FAR WEST AS CHICAGO AND ST. LOUIS.

ENGINEERING ASSISTANT ROSE ANN LONGNECKER CHECKS THE OPERATION OF A TELEVISION SET IN THE MAINTENANCE SHOP OF THE EXHIBITION HALL.

Two or three days a week NBC, in cooperation with the Schwerin Research Corporation, conducts television audience reaction tests in the theatre. NBC also utilizes the theatre to show kinescope recordings of programs, such as the Chesterfield Supper Club, to members of the cast. At times, RCA Victor auditions its recording artists here.

RCA Victor dealers, distributors and Service Company branch managers meet regularly in the Executive Lounge which also serves as the setting for photographs of RCA home instruments.

One day a month has been set aside in the Hall's engagement book as "Electron Microscope Day". On this occasion slides, a film and demonstration of the electron microscope are presented to as many college, scientific and professional groups as can be accommodated. Students, especially, are attracted by the variety of electronic wonders which the Hall has to offer. School classes numbering upwards of 30,000 pupils have been taken on tours and have watched motion pictures in the Johnny Victor Theatre.

RCA hospitality has been extended through the Exhibition Hall to gatherings representative of nearly every phase of American industry and institution. A typical weekly schedule includes the names of organizations such as Eastern Air Lines, United States Rubber Co., Twentieth-Century Fox, March of Time, American Tuberculosis Assoc., Museum of Modern Art, Citizens Committee for Displaced Persons, Boy Scouts Organization, Institute of Radio Engineers, and Juilliard School of Music. Programs in which these groups participate usually consist of film previews, rehearsals, classes or demonstrations for the press.

A casual visitor to the Hall's concourse level might find Jane Pickens rehearsing a concert before 70 guests, Arturo Toscanini entertaining foreign visitors, or encounter a meeting of the Television Writers' Guild.

### *Special Events Given Attention*

Special events call for special attention by the Exhibition Hall staff. On election night the Hall remained open until 5 a.m., attracting capacity crowds. Returns were televised on a 6- by 8-foot screen in the Johnny Victor Theatre and on the many receivers installed on the main floor. This same procedure was followed for the championship prizefights and World Series telecasts at which time special tickets had to be issued to regulate attendance.

More people have been introduced to television in the Exhibition Hall than at any other place. Questions of every nature concerning the new art are answered by a competent staff of eight public relations representatives. These young men are thoroughly instructed in every phase of RCA operations so that they may transmit this information intelligently to interested guests.

Each piece of equipment in the Hall must be kept in perfect condition, since it is used for demonstration as well as display. Twelve television receivers and approximately fifteen radios and radio-phonograph combinations are available for inspection by an average of 3,000 persons each day. Duplicate sets are held in reserve for replacements when models on display require extensive servicing or overhauling. An engineering staff works steadily on routine check-up and repairs, particularly those made necessary by visitors who are souvenir hunters.

Behind the scenes, 23 persons work diligently to keep RCA's Radio City showplace mechanically perfect and to plan, coordinate and supervise its numerous activities.

The fact that it has attracted a multitude of visitors from every state in the Union and more than a hundred thousand overseas guests indicates that the Exhibition Hall is recognized by the public as a symbol of RCA preeminence in radio, television and electronics.

# "Macbeth" Sets Video Record

*Top Names of Stage, Lavish Scenery and Costumes Feature History-Making Television Production by NBC*

THE biggest, most lavish and, if paid for and sponsored, the most expensive production on television was The Players' Club presentation of Shakespeare's "Macbeth" on the NBC Television Network, Sunday, May 1. To pay the cast alone, top names of Hollywood and Broadway, would have cost around $25,000. The rehearsal, air and studio time, plus the cost of the sets and costumes, would have run the total cost well over $1,000,000.

An analysis of the time and work expended on the three interior and three exterior sets in Studio 8G and the two sets made for the portions of the play produced on film shows that to run, setup and strike the sets required ten men working a total of 107 hours.

To build and paint the sets required 203 hours, 16 men and 20 gallons of paint. Some of the painting was done after the sets were erected in the studio. Five property men were needed for the production. A hauling crew of three men was required to bring the props, sets and costumes into the studio and a secretary to keep track of the crew and their various pickup points.

The costumes — approximately three changes for each of the 35 members of the cast—were obtained from the two largest theatrical costume houses in the city. Ten tailors, working eight hours a day for three days were used to get the clothes ready, and it required the services of six dressers at the dress rehearsal and while the program was telecast to aid the actors and actresses in their changes.

Seven makeup experts were used to make up the cast and five property men were required to keep track of the various props used during the show.

There were four cameramen and five light men used on the production.

### *Adapted Drama for Telecast*

Henry Fisk Carlton adapted the drama to fit the hour telecast. Since members of The Players' Club were doing the play as their annual observance of the Bard's birthday, two sets of producers and directors were used. Harold McGee and Anthony Brown were the producer and director respectively for The Players and the late Owen Davis, Jr., and Garry Simpson held down the same spots for NBC. Walter Wagner of The Players was the only stage manager.

The top names of The Players' Club roster — who are also top names of the Broadway stage — played in the production. Walter Hampden, president of the club, played the role of Macbeth and the three highest-paid Witches ever to essay the roles were Bobby Clark, David Wayne and Edgar Stehli.

Others in the star-studded cast were Joyce Redman as Lady Macbeth, Walter Abel as Macduff, Paul McGrath as Banquo, Leo G. Carroll as Duncan, Sidney Blackmer as Ross, Alexander Clark as Lennox, Philip Truex as Malcolm, John Drew Devereux as Donalbain, Ben Lackland as Seyton, Ralph Bellamy as Porter, John Carradine and Charles Brokaw as the first and second murderers, Frank Wilcox as Caithness, Ernest Rowan as Menteith, Maurice Wells as Angus, Douglas A. Clark-Smith as the doctor and John Craven as the manservant.

Even the "spear-carriers," in the production rated among the first names of the legitimate theatre Ladies-in-Waiting were Viola Keats and Margaret Garland. Gentlewomen were Elizabeth Dewing, Virginia Downing, Monica Lang, Abby Lewis, Sonia Sorel and Margot Stevenson. Soldiers were Jack Benwell, Richard Ellington, Carl Frank, Storrs Haynes, Don Moore and Nelson Way.


JOYCE REDMAN AS "LADY MACBETH" IN NBC'S EPOCHAL TELEVISION PRODUCTION OF THE SHAKESPEAREAN TRAGEDY.

WALTER HAMPDEN, NOTED STAGE ACTOR, PLAYED THE TITLE ROLE IN "MACBETH", SUPPORTED BY AN IMPRESSIVE CAST OF BROADWAY AND HOLLYWOOD STARS.

# Zworykin Receives Lamme Medal

*American Institute of Electrical Engineers Honors RCA Laboratories' Vice President for Contributions to Television*

DR. Vladimir K. Zworykin, Vice President and Technical Consultant of the RCA Laboratories Division, received the Lamme Medal, an outstanding award for scientific and technical achievement, from the American Institute of Electrical Engineers at its annual meeting in Swampscott, Massachusetts, on June 22.

Dr. Zworykin was awarded the medal "for his outstanding contribution to the concept and design of electronic apparatus basic to modern television." The award, established in 1928 through a bequest of Benjamin Garver Lamme, chief engineer of the Westinghouse Electric & Manufacturing Company, was presented by Everett S. Lee, Institute President.

Brig. General David Sarnoff, Chairman of the Board of RCA, in presenting Dr. Zworykin, hailed him as the "scientist extraordinary of this age" and recalled highlights of the host of scientific contributions achieved by the medalist since his arrival in this country 30 years ago.

"His great love was television," General Sarnoff said, "and he worked tirelessly toward the goal of an all-electronic system that would some day prove to be the world's greatest means of mass communication, education and entertainment. His first achievement was development of the basic principles of the now famous iconoscope tube. Then he began working on an over-all system incorporating this new electronic 'eye.' To achieve this he also developed the kinescope, or television picture tube, for the receiver."

With the development of these tubes, the television tide turned from the mechanical to the electronic system, General Sarnoff pointed out. ". . . In 1929 he demonstrated all-electronic television publicly for the first time, proving that it was far superior to the old mechanical system with its motor and revolving disc. Scanning was done electronically and the picture was reproduced electronically."

General Sarnoff cited other developments to which Dr. Zworykin has lent his great talents: secondary emission multipliers, image tubes, the electron microscope, and a universal electronic computer, which may open the door to weather prediction and control beyond anything yet achieved.

"It is recorded that during World War II, Dr. Zworykin performed outstanding service as a member of the Scientific Advisory Board to the Commanding General of the United States Army Air Force, the Ordnance Advisory Committee on Guided Missiles, and three important sub-committees of the National Defense Research Committee," General Sarnoff said.

### *Received Presidential Certificate*

"In the course of his war work, he directed research resulting in the development of fire control, television guided missiles, infrared image tubes for Sniperscopes and Snooperscopes, and storage tubes. He received the Presidential Certificate of Merit in recognition of his distinguished achievements during the war."

In accepting the medal, Dr. Zworykin said that the rise of the scientist in public esteem presented an opportunity for the reexamination of the engineer, not only as a contributor to our standard of living but to the progress of science itself.

"The man in the street becomes conscious of scientific advances only as the engineer translates them into an instrument, a manufacturing process, or a machine," Dr. Zworykin stated. "The strategic importance of the engineer in making products of scientific discovery available to the public becomes evident when, for prolonged periods, a scientific discovery remains dormant because engineering talent is not applied to its utilization."

DR. V. K. ZWORYKIN

Pointing out that we ordinarily think of engineering development following scientific discovery, Dr. Zworykin declared that, "At the moment we are more interested in the fact that engineering progress uniformly promotes scientific discovery by giving the scientist tools of increasing effectiveness.

"The present development of nuclear science appears inconceivable without the assistance received from the electronic industry in the form of high-power oscillator tubes and control equipment of all kinds. The same applies to the study of cosmic rays, the research into the nature of the electron through the study of atomic resonances, and almost every other problem in the forefront of present-day scientific interest."

Reviewing the development of television, the scientist said that its growth appears to be limited only by the space in the frequency spectrum, adding:

"There are, however, many applications of television which are not so limited. If the transmission is by cable or along sharply defined radio beams, the problem of interference, and hence of frequency allocation, vanishes. As a matter of convenience, it has become customary to refer to television applications satisfying this condition as 'industrial television.' Special compact cameras and receiving units

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DR. IRVING WOLFF, DIRECTOR OF THE RADIO TUBE RESEARCH LABORATORY, RCA LABORATORIES, RECEIVES THE DISTINGUISHED PUBLIC SERVICE AWARD FROM REAR ADMIRAL C. D. WHEELOCK, FOR HIS WORK IN ELECTRONICS AND RADAR.

# Navy Honors Dr. Wolff

***Director of Radio Tube Research Laboratories at Princeton Receives Distinguished Public Service Award for Achievements in Electronics and Radar***

IN CEREMONIES at Princeton, N. J., on May 24, Dr. Irving Wolff, director of the Radio Tube Research Laboratory of RCA Laboratories, received the "Distinguished Public Service Award" of the Navy Department, in recognition of his achievements in electronics and radar.

The award, which included a certificate signed by Secretary of the Navy, John L. Sullivan, was presented by Rear Admiral C. D. Wheelock, U.S.N., Deputy Chief of the Bureau of Ships. It is the highest honor bestowed on a civilian by the Navy.

Such recognition is given only to individual citizens, not in Navy employ, who "have contributed measurably in scientific or manufacturing fields to the success of the Navy's policies and programs," the Secretary's office stated. In addition, the recipient must have rendered outstanding service over and above that normally expected of him and not required by his job or the terms of his contract.

### *Aided Navy's Effectiveness*

"Dr. Wolff contributed immeasurably to the effectiveness of the operation of the Navy during the late war, and the interim period since then," the Navy spokesman declared. "His achievements and accomplishments covered the field of electronics in general, but more particularly that of radar.

"In 1932, while in the employ of the Radio Corporation of America, he conducted research in microwave transmission and reception. Using equipment developed as a result of this research, he demonstrated the ability to detect radar signals reflected from gas tanks and small ships about a half-mile distant. Shortly thereafter, he developed a means of timing these signals, whereby distance to the reflecting object could be measured. This was one of the fundamental contributions to modern day radar."

Later Dr. Wolff and his associates developed airborne radar equipment to prevent collisions and high-altitude precision radar for altitude determination, it was pointed out. The radio altimeters used by the United States and her Allies were developed by Dr. Wolff's group.

"Had he been content to do only what was expected of him," the Navy statement said, "the Navy and other Armed Services would have been deprived of equipment that proved invaluable in the successful prosecution of the war and increasing the safety of air and sea navigation since the cessation of hostilities."

Dr. Wolff received the B. S. degree in physics from Dartmouth College in 1916 and a Ph.D. degree in the same subject from Cornell University in 1923. He was an instructor in physics at Iowa State College in 1919 and at Cornell from 1920 to 1923, where he was a Heckscher Research Fellow in 1924.

He joined RCA in 1924 as a member of the Technical and Test Department and from 1930 to 1941 was with the Research Division of the RCA Manufacturing Company, Camden, N. J. In the latter year, he jointed the staff of RCA Laboratories. He has specialized in problems in microwaves, sonar, radar and aviation.

Dr. Wolff is a fellow of the Acoustical Society of America, the Institute of Radio Engineers and the American Association for the Advancement of Science; and a member of the Physical Society and Sigma Xi.

# RCA TO OPEN NEW TV PLANT

EXTENSION of television receiver production to a third plant of the RCA Victor Division was begun early last month with the installation of new equipment and conversion of other facilities at the Division's Bloomington, Indiana, factory.

To help meet increasing demand for RCA Victor's television receivers, approximately one-third of the 226,000 square feet of manufacturing space in the modern one-story Bloomington plant will be initially devoted to TV set production. This extension supplements present operations in Camden and Indianapolis, with provisions for later expansion of the Bloomington space as required.

Production lines are scheduled to start in August, and are expected to reach full output by September. The entire operation will be automatic, with conveyors used to facilitate materials handling. Use of a special arrangement for adjusting the height of conveyor lines will permit interchangeable production of table-model, consolette, and console instruments.

"This extension of television production, involving facilities valued at more than half a million dollars," said H. G. Baker, general manager of the Home Instrument Department, "is a reaffirmation of RCA Victor's faith in the continuing growth and stability of the television industry."

In addition to television receivers, the Bloomington factory will manufacture all of the intricate television tuners or station-selector switches required for both its own production and that of its companion plant at Indianapolis. It will also continue to produce the company's full line of table-model, portable, and personal radios, as well as all RCA Victor radio chassis for radio-television combinations.

Inauguration of television operations at Bloomington will raise to four the number of RCA Victor plants assigned to various phases of television production in Indiana. The others are the Company's largest television receiver factory, at Indianapolis; a cabinet factory at Monticello, and the new television picture tube factory now under construction at Marion.

The Bloomington plant will remain under the management of T. S. Weeks, who will supervise television production in addition to continuing his supervision of radio production.

# RCA Institutes Graduation

*(Continued from page 23)*

can perfect a wrist-watch radio, and eventually a miniature television set!"

As some other examples of outstanding developments in electronics undreamed of only a few years ago, General Sarnoff mentioned the RCA Ultrafax system which is capable of transmitting a million words a minute; Teleran, a combination of television and radar, of vast importance in air navigation and traffic control; radio-controlled planes and electronic maritime navigation aids; and the electron microscope which can peer deeply into submicroscopic realms.

"A serious error that must be avoided when considering the heights of achievement reached in electronics," declared General Sarnoff, "is to think that everything has been done. The radio-electronic developments I have mentioned here are but an index to the opportunities that exist.

"Progress calls for not only research scientists and experimenters, development and design engineers, but also for operators and technical repairmen, mechanics and testers. Each field offers chances for advancement, and it is encouraging to realize that from each branch of radio-electronics new trails will be blazed. Therefore, it behooves you to select that field which appeals most to you and to follow it with all the talent, initiative, eagerness, and hard work that you can muster.

"Let me repeat: The most important factor to keep in mind is to continue your education. Science and industry will reward you for your talents and energy. Out of your efforts may come inventions, new products, processes and services. Through your achievement, I hope that you will find success and happiness—enhanced by the knowledge that you are contributing to progress for the benefit of this Nation and its people. There is everything good yet to be accomplished in our lives and in our work. What man has done, man can do better. May each one of you be that man."

## Canadian Doctors Watch Surgery by Television

Television as a medium of medical and surgery instruction was demonstrated for the first time in Canada by RCA Victor during the national convention of the Canadian Medical Association, held in Saskatoon on June 13-15.

Television equipment worth $100,000, including two cameras, control apparatus and a transmitter were installed at the Saskatoon General Hospital where the surgical operations were televised. The programs, broadcast for an hour each day, were sent 1¼ miles by microwave radio relay from the hospital to convention headquarters where they were viewed on twelve 10-inch and 16-inch RCA Victor television receivers. In addition, 6- x 8-foot pictures of the operations were shown on an RCA television projection unit installed at the hotel.

Arrangements for the demonstration were made in cooperation with the E. R. Squibb & Sons International Corporation.

## NBC Extends TV Net

Five television stations have been added to NBC's rapidly expanding TV network, bringing the chain's total television outlets to 45. The new stations are WKY-TV, Oklahoma City; WBRC-TV, Birmingham; WBTV, Charlotte; WOW-TV, Omaha, and WMBR-TV, Jacksonville.

# TELEVISION IN INDUSTRY

*Use of Video Equipment in Commercial Fields May Exceed Scope of TV in Homes, Watts Tells Milwaukee Engineers*

USE of television in industry may develop into a service broader in scope than that of video programming for the public, greater even than those that might be encompassed by the widest sweeps of imagination conjured up by science fiction writers. This prospect was outlined recently by W. W. Watts, vice president in charge of the RCA Engineering Products Department, in an address to the Engineers Society of Milwaukee.

Speaking on the subject, "Television's New Directions", Mr. Watts described some of the applications of television to industry which are now being explored. He mentioned particularly the use of fixed-focus cameras in laboratories and at critical points in production lines to facilitate inspection of materials and observation of processes and gauges in locations where explosive materials, dangerous gases, extreme temperatures, or difficult access make it impracticable to station a human observer. Other uses he envisaged included the probable uses of television in traffic safety, the guarding the asylum and prison corridors, retailing, teaching, graphic communication, and the theatre.

Outlining a system to detect fouls in horse racing, he described how six television cameras mounted around the track could provide stewards with a head-on view of the entire race on television screens, especially those portions of the course that are difficult to see from the judges' stand.

In the field of education, he added that television has proved to be a particularly brilliant and useful servant of society. He told of the numerous applications of television to medical and surgical teaching which have been found, and of the explorations conducted in schools through the cooperation of stations, school officials and manufacturers. He explained how television can look down the eye-piece of microscopes and throw the images on large screens before classrooms; how manufacturing methods in fields ranging from heavy engineering to watchmaking can be taught to large groups quickly, and how the best of facilities and faculties can be made available simultaneously to all students in an area by broadcast or direct-wire television service.

New applications of television, he said, are "an inviting frontier for creative engineering, and a source of prestige, fortunes, and opportunities to render service to the world."

## Zworykin Receives Medal For Work in Television

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are being built for such purposes."

Potential applications of "industrial television" cited by Dr. Zworykin included: observation of machines or gauges in inaccessible places; monitoring of dangerous operations from a distance; telecasting of important meetings for press coverage or overflow audience; presentation of fashions or other merchandise on television receivers in stores, and in hospitals for observation of operations, surveillance of patients and entertainment of patients.

"The greatest benefits can only be achieved through the intimate interplay of fundamental science and engineering," Dr. Zworykin concluded. "As long as both fields of endeavor are adequately staffed and exchange information freely, we need not fear for the material progress of our civilization."

The Lamme Medal is the latest in a long series of awards and honors bestowed on Dr. Zworykin. These include: The Morris Liebmann Memorial Prize of the Institute of Radio Engineers, the Benjamin Count Rumford Medal of the Boston Academy of Arts and Sciences, the Howard N. Potts Medal of The Franklin Institute, the Rumford Medal of the American Academy of Arts and Sciences, the Gold Medal of the Poor Richard Club, the annual award of the Television Broadcasters Association and the Cross of the Chevalier of the French Legion of Honor.

A graduate of the Institute of Technology, St. Petersburg, he received the Doctor of Philosophy degree from the University of Pittsburgh in 1926. Brooklyn Polytechnic Institute has conferred upon him the honorary degree of Doctor of Science.

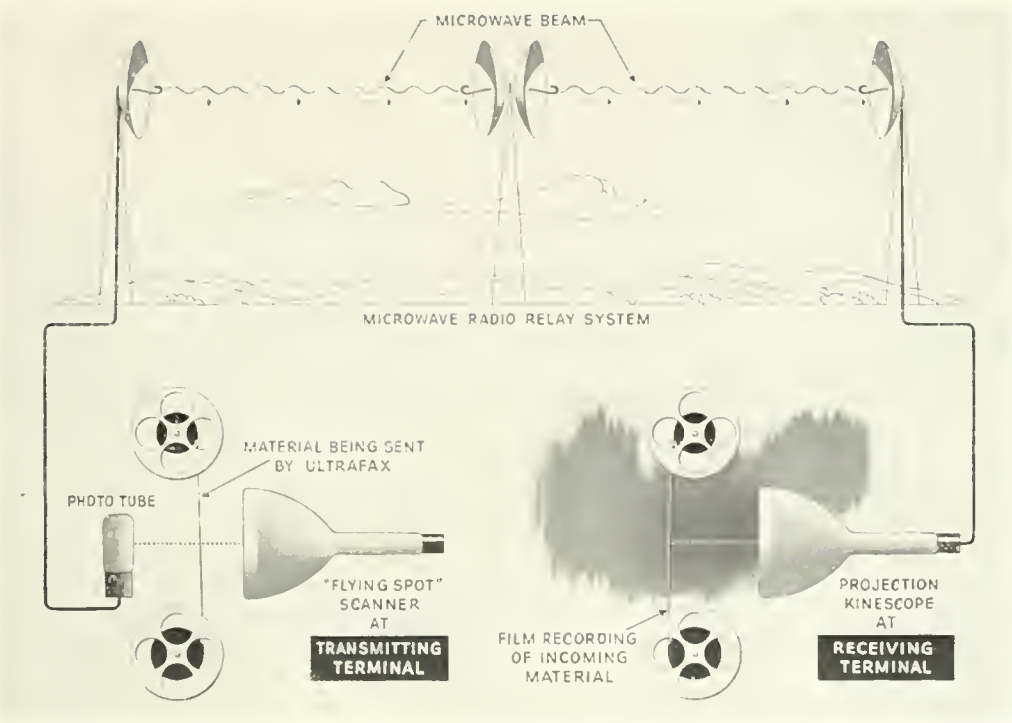
In addition to being a Fellow of the A. I. E. E., Dr. Zworykin is a member of the Institute of Radio Engineers, the American Physical Society, the American Association for the Advancement of Science, The Franklin Institute, Electron Microscope Society of America, Sigma Xi, the National Academy of Sciences, the American Academy of Arts and Sciences, and the French Academy of Science.

## NBC Grants 5 Fellowships To Summer Radio Institutes

Nine ministers, directors of religious education, and laymen in religious radio have been granted fellowships to the NBC Summer Radio Institutes by the National Broadcasting Company and the Protestant Radio Commission, it was announced recently by Sterling W. Fisher, manager of NBC's Public Affairs and Education Department.

The awards were made to those who are currently planning and providing radio programs on sustaining time for state and city federations of churches, and ministerial associations of other interdenominational agencies. Each fellowship carries a stipend of $150, which will cover tuition and a portion of the recipient's traveling expenses.

The Summer Radio Institutes are conducted by NBC in cooperation with Northwestern University, University of California at Los Angeles and Stanford University.






SIMPLIFIED DIAGRAM OF A COMPLETE ULTRAFAX SYSTEM SHOWING THE PRINCIPAL ELEMENTS WHICH MAKE POSSIBLE THE MILLION-WORDS-A-MINUTE TRANSMISSION SPEED OF THE NEWLY DEVELOPED MEDIUM OF COMMUNICATION.

# Ultrafax: Million Words a Minute

*Sarnoff Foresees Ultrafax Opening New Era in National and International Communications—He Urges Study Looking Toward the Establishment of a New National Communications Policy*

ULTRAFAX, a newly developed system of television communications capable of transmitting and receiving written or printed messages and documents at the rate of a million words a minute, was demonstrated publicly for the first time by the Radio Corporation of America at the Library of Congress, Washington, D.C., on October 21.

Brigadier General David Sarnoff, President and Chairman of the Board of RCA, declared that Ultrafax, which splits the seconds and utilizes each fraction for high-speed transmission of intelligence, is as significant a milestone in communications as was the splitting of the atom in the world of energy.

Among the possible developments which General Sarnoff foresaw were:

1. The exchange of international television programs achieved on a transoceanic basis.

2. A service of television and Ultrafax by which the same receiving set would bring various types of publications into the home, or a newspaper for that matter, without interrupting the program being viewed.

3. A system of world-wide military communications for this country, scrambled to the needs of secrecy, which with ten transmitters could carry in sixty seconds the peak load of message traffic cleared from the Pentagon Building in twenty-four hours during the height of World War II.

4. The establishment of great newspapers as national institutions, by instantaneous transmission and reception of complete editions into every home equipped with a television set.

5. The transmission of a full-length motion picture from a single negative in the production studio simultaneously to the screens of thousands of motion picture theatres throughout the country.

6. The possibility of a new radio-mail system with the vast pickup and delivery services of the Post Office Department.

Representatives of the United States Armed Forces, Government agencies, industry and the press witnessed the introduction of this advanced communications system. RCA presented the demonstration as a "progress report" to show that the system has reached a stage of development where plans can be