CDC BULLETIN

OCT. NOV. DEC. 1949

FEDERAL SECURITY AGENCY
Public Health Service
Communicable Disease Center
Atlanta, Ga.

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Contents

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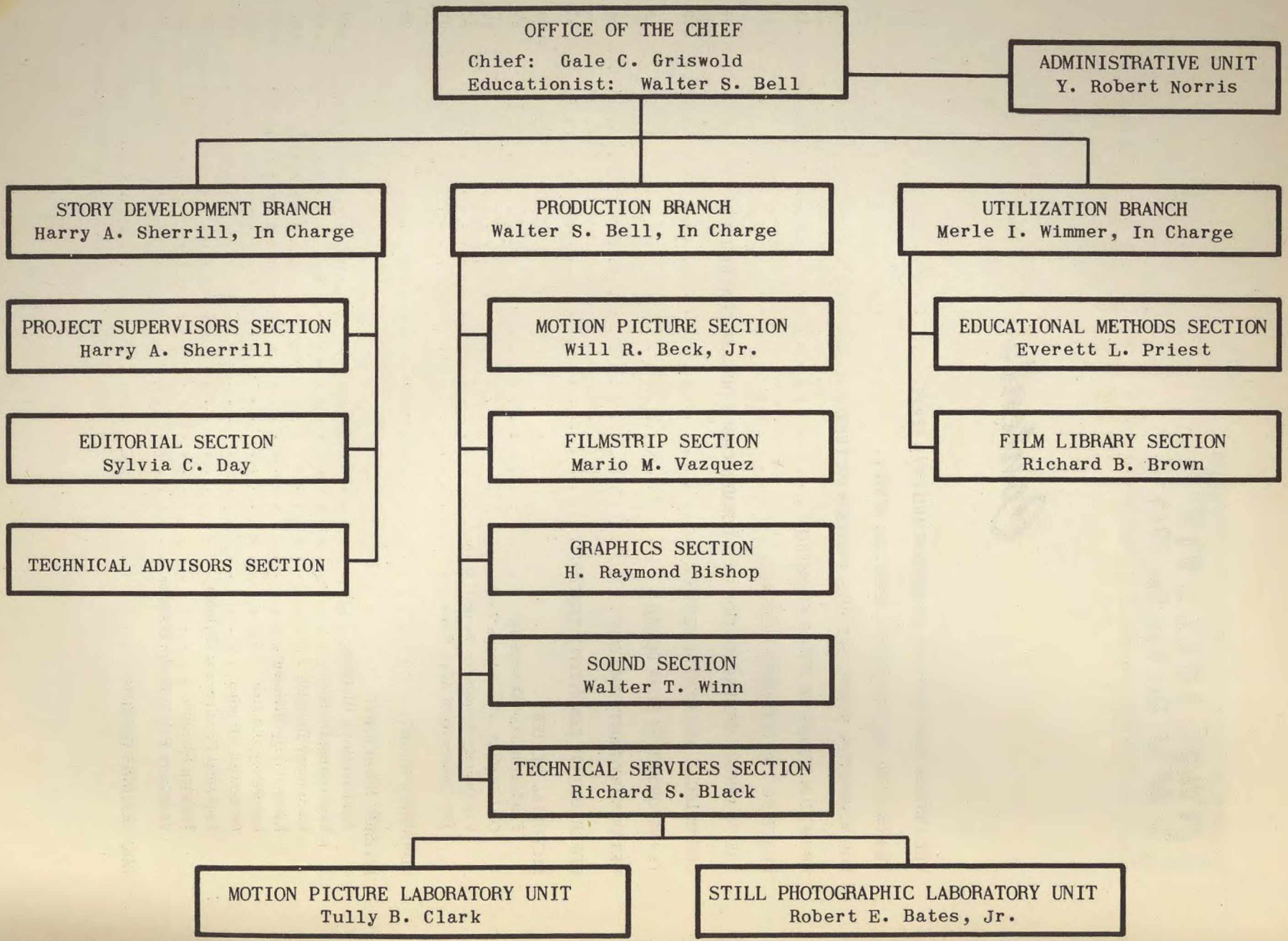
AUDIO-VISUAL PRODUCTION DIVISION *



* *The Production Division became the Audio-Visual Production Division effective November 17, 1949.*

FSA-Atlanta, Ga.

The PRODUCTION DIVISION
Its Mission and Operation

GALE C. GRISWOLD, CHIEF,
PRODUCTION DIVISION

The Production Division is the audio-visual facility of the Communicable Disease Center. It is equipped to provide all types of audio-visual service. The Production Division operates with six clear-cut general objectives:

1. To produce audio-visual materials to be used in the training of communicable disease investigation and control.
2. To distribute such materials to Communicable Disease Center Headquarters and field training activities, State and local health departments, graduate schools of hygiene and public health, departments of preventive medicine, and sanitary engineering in schools, colleges, and universities.
3. To help training personnel acquire the skills necessary to select, use, and evaluate these materials in their training programs.
4. To act as a service organization to other Divisions of the Communicable Disease Center by supplying photographs, photomicrographs, slides, and exhibits to document their operations.
5. To produce, upon request and reimbursable basis, audio-visual training materials for other units of the Public Health Service.
6. To cooperate with other governmental agencies, through the Interdepartmental Committee, to provide means for exchange of information, ideas, and experiences, and to prevent duplication of production through mutual planning and activities.

PRODUCTION

Productions in a given field are undertaken when there is an expressed need for audio-visual materials to implement specific training programs. Close cooperative relations are maintained with those Communicable Disease Center Headquarters Divisions primarily concerned with training. Conferences have been held with training personnel in each of these Divisions, to discuss mutual problems to establish priorities of needed materials, and to develop a long-range production program.

Close liaison has been maintained with the Audio-Visual Committee of the Association of Professors of Preventive Medicine. Several conferences have been held with this Committee, and a long-range program has been developed to meet their needs for audio-visual materials in the field of communicable disease investigation and control. Similar conferences have been held with representatives from schools of hygiene and public health, and with sanitarians and sanitary engineers.

Whenever practical, the Division promotes the idea of a complete audio-visual training unit, consisting of motion picture, filmstrip, and instructor's guide -- all bearing on the same subject. Experience has shown that some phases of a unit are best taught by a motion picture which highlights the continuity of presentation, shows motion where motion is needed, and creates in the learner a sense of reality through vicarious experience. The motion picture may serve for orientation, or general summarization. The filmstrip on the same topic covers the details not possible to present through the

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motion picture, enables a step-by-step analysis of a procedure or a principle, and when used without the sound accompaniment, provides flexible presentation by the instructor to meet training level, opportunity for classroom discussion, and emphasis of key concepts. The instructor's guide provides additional supplementary reading material, discussion questions, and assistance to the instructor in preparing his presentation in an effective manner.

When priorities are established and a production is approved, it is assigned to a project supervisor. Production of audio-visual materials is a result of teamwork, in which many individuals cooperate. The first part of the team is the Project Supervisor-Technical Adviser group. It is a basic policy of the Production Division that no audio-visual production is undertaken until the Division or Agency requesting the material guarantees the availability, when needed, of a full-time technical adviser. This adviser is responsible for the technical accuracy and adequacy of the finished product, and works closely with the project supervisor, furnishing him all necessary technical information during the preparation of the script. He also checks the actual "filming" where technical operations are involved, and reviews and approves the finished production for technical accuracy before final release. It is the responsibility of the project supervisor to take the information furnished him by the technical adviser and put it into an audio-visual form.

During the preparation of the shooting script, utilization and evaluation experts assist in assuring that the material is a good training medium. The results obtained from field surveys are thus available for incorporation into the production. The Production Division is unique among government film agencies in that utilization and evaluation experts have a direct voice in preparing productions.

Once the shooting script is approved, it is put into actual production. The Division has complete facilities and personnel to handle completely all phases of production. Camera crews, sound engineers, artists, and laboratory processing personnel are all part of the team, and work closely with the project supervisor assigned to the production.

DISTRIBUTION

The success of any agency producing audio-visual materials is dependent upon the demand for materials it produces. The demand is generated by the pertinence of the subject matter to the training situation and the quality of the product. Of greater importance than large audiences are the type, number, and variety of groups which use the productions to help solve their training problems.

Close liaison is maintained with all the specialized professional groups for whom these training aids are produced. Every effort is made to insure that these training materials are available to the user when needed. For this service the Production Division maintains a film library.

From this library, film service is available throughout the world for professional groups concerned with problems of training in public health, medicine, and other biologic sciences related to health. All initial distribution of CDC films is made as indefinite, short term, or special loans from the film library. All loans are free of charge.

UTILIZATION AND EVALUATION

Some of the major problems of this era of mass communication are proper selection and correlation of available audio-visual training materials with the activities or curriculum of the training program, and proper presentation to the trainees. Wherever possible, assistance is given to acquaint the potential user with the audio-visual tools which will implement his training program. To further implement training, utilization materials such as instructor guides and other publications for improving educational methods are prepared and distributed. Work shops are conducted where emphasis is placed upon administration of an audio-visual program and educational methods. Demonstrations and lectures on utilization practices are given for various groups when requested.

Aside from the evaluation done within the Production Division through the utilization materials, an attempt is made to encourage instructors to employ critical judgment in examining these tools. These tools must be evaluated

in terms of solving problems and reaching objectives. Therefore, each instructor must do his own evaluation in terms of his specific and ultimate objectives. The evaluation will normally vary according to the objective.

A much more extensive program of evaluation is anticipated for the future.

A film in the can has only a monetary value. A film on the screen has some educational value merely because it is being shown to a group. A film presented according to a carefully prepared plan can approach its maximum value.

PRODUCTION OF EXHIBITS, PHOTOGRAPHS, AND MISCELLANEOUS TRAINING AIDS

As the Communicable Disease Center becomes more and more audio-visual conscious, the requirements for all types of service from the Production Division become consistently larger. The photographic and art work of the Division are used extensively for illustrating lectures, demonstrations, and exhibits as well as for numerous published articles. The Division acts as a photographic and art service organization for the other Divisions of the Center, and in many cases for other agencies of the Public Health Service. Work done for Public Health Service activities other than CDC is done on a reimbursable basis. Both black and white and color photographic work is done. Much of this work is for purposes of documentary operations and activities of CDC as well as for audio-visual use.

PRODUCTION FOR OTHER AGENCIES OF THE PUBLIC HEALTH SERVICE

The facilities and personnel of the Production Division are concerned with production of training films for professional and subprofessional groups. The Division can therefore make training films for other units of the Public Health Service with a minimum amount of orientation on objectives and policies. The services of the Division have been requested from time to time for such productions. Inasmuch as the budget of the Division is only intended for training films in the field of communicable disease investigation and control, any such services must be on a reimbursable basis. Additional project supervisors, cameramen, and artists are hired on a WAE (while actually employed) basis to take care of such outside productions. Stand-by services with commercial producers are also maintained to expedite these productions in an emergency. The Production Division has entered into agreements with the following to render production services as requested: National Heart Institute, Venereal Disease Division, Chronic Disease Division, Dental Division, Hospital Facilities Division, and National Cancer Institute.

INTERDEPARTMENTAL COMMITTEE

In order to avoid duplication of effort, all governmental agencies engaged in producing medical and public health films clear their productions through the Interdepartmental Committee on Medical Training Aids. This committee, composed of representatives from Army, Navy, Air Force, Veterans Administration, and the Public Health Service, meets once a month in Washington. The Chief of the Production Division is the Public Health Service representative on this committee. All initial production proposals for motion pictures and filmstrips are presented to the committee for review, suggestions, and approval for production.

In any case where two agencies are planning to produce audio-visual materials on the same subject, decision is reached as to which agency shall produce the film. All film productions in which more than one agency is interested are submitted for more detailed criticism, and material is incorporated and treatment adjusted so that the film produced on the subject by one agency will be suitable for use by the other governmental agencies concerned. In this way, needless duplication is eliminated.

Where the stake of two agencies in a given field is high, a cooperative working relationship is set up whereby the productions become the joint responsibility of the two agencies.

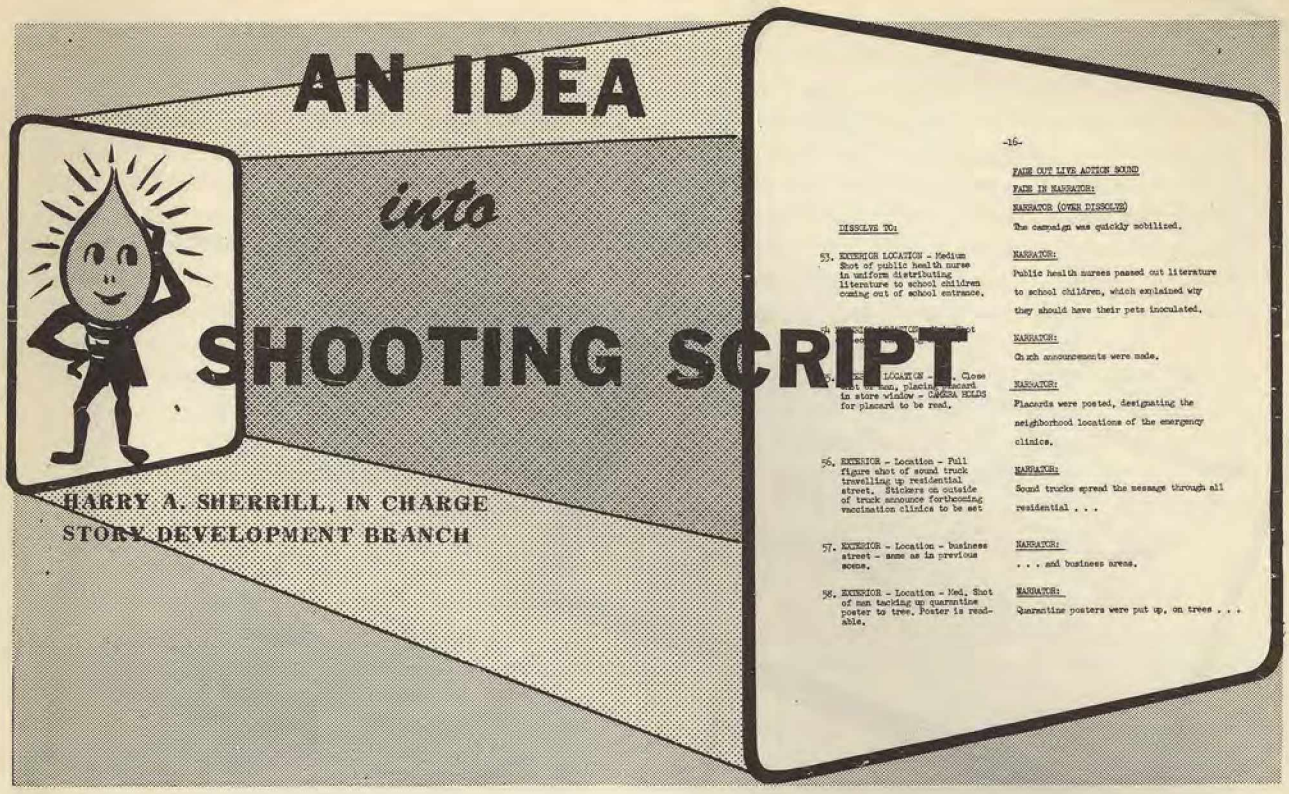
An excellent example of such a relationship is found in the current project on a series of films on rat control in which the Production Division is cooperating with the Army Medical Services. The CDC is furnishing the technical advisers for these films, preparing the shooting scripts, and furnishing locale for the shooting, experimental sets, rat-handlers, and the extremely large amount of electrical power needed

for illuminating the sets at night. The Army is furnishing the camera crews, building the final sets, and editing the films for final release. When released, the films must be approved by both CDC and the Army.

CURRENT PROGRESS

In carrying out its mission of developing and producing audio-visual aids for the training and operational agencies which it serves, the Production Division concentrates on ascertaining the audio-visual requirements of these agencies and on meeting these requirements by initiating appropriate production schedules. To date, 65 motion pictures and 112 filmstrips have been released; and 28 motion pictures and 30 filmstrips are in various stages of production. The steps from story to shooting script and from shooting script to completed motion picture and filmstrip accompanied by utilization literature are outlined and illustrated in the following four articles.

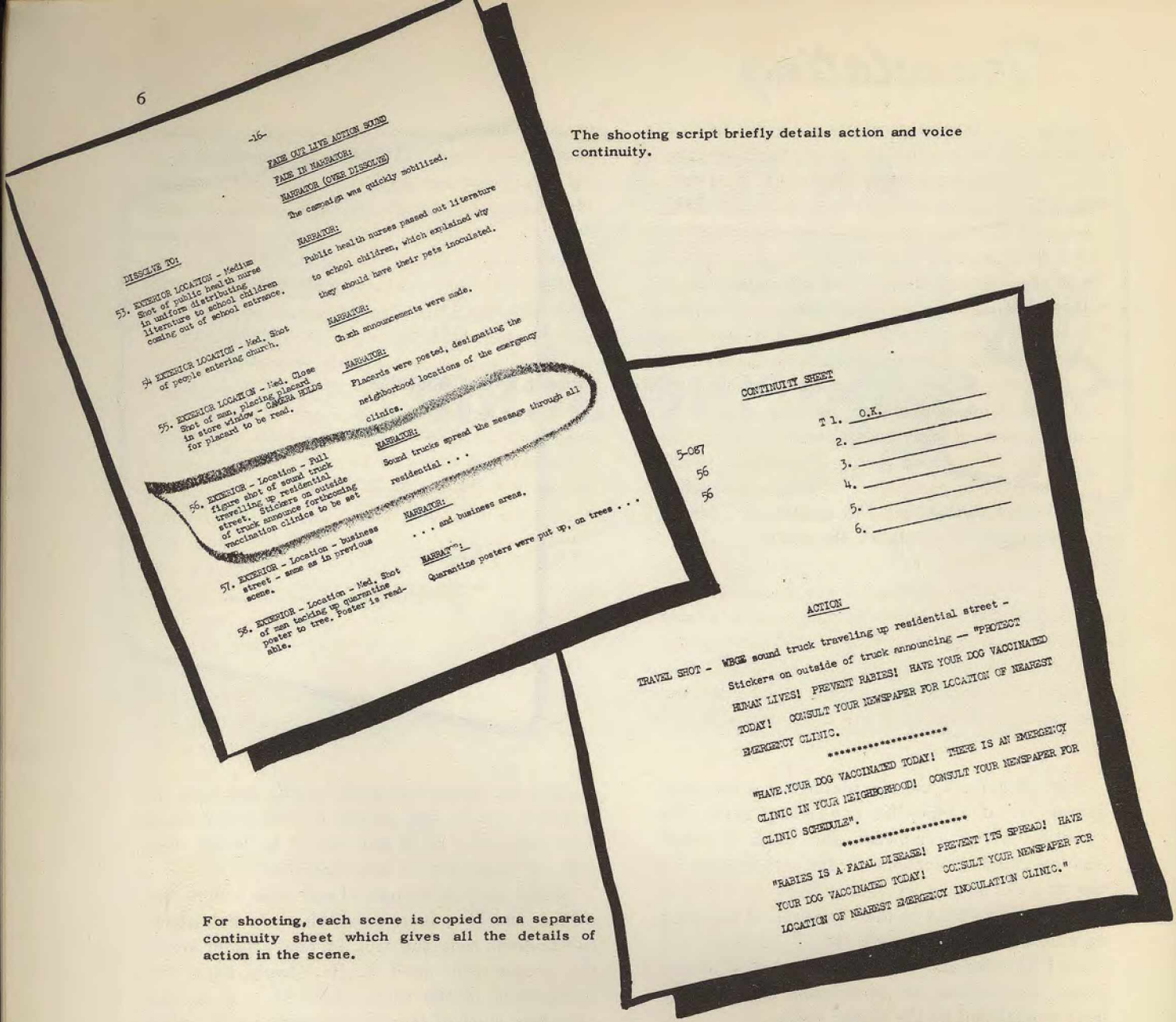
Translating



The idea for a motion picture or a filmstrip grows out of a specific training need. The shooting script organizes the subject matter and provides directions to the cameraman for the translation of these facts to the film medium. The script is also a means of reaching agreement between technical advisors and visual specialists as to the accuracy of the ideas, techniques, or procedures as they have been visualized by the script writer.

Educational or training film scripts are unlike Hollywood scenarios in that they appeal to the intelligence of the audience instead of the emotions. The sole purpose of a training film is to guide the thinking of the audience into preconceived channels. This should be done as interestingly as possible . . . it can even be done entertainingly . . . but the PRIMARY purpose of training films is not to entertain. It is to teach. A training film is not just an idea in somebody's mind . . . it is the answer to an existing training problem. And unless the film is the RIGHT answer to this problem, it is unlikely that the film will have much value. Unless the instructor really needs the film, he will not use it; and unless it tells students something they need and desire to learn, they will not respond to it intelligently.

So the project supervisor who writes the script must first learn as much as he can about the reasons why the film is needed and about the people who need it. He should know the background of the audience so that he can eliminate much of the subject matter with which his audience is already familiar and devote the film footage to teaching the things they need to learn. The continuity of thought of the learner is a fragile thing, and the writer must present his subject so that HE WILL NEVER LOSE audience understanding during any second of the 15 to 20 minutes of the film. The film moves on at 36 feet a minute . . . there is no chance to go back and see the scene again. Once the learner has lost the train of thought, he may be befuddled for the rest of the film. The really good motion picture or sound filmstrip is one in which audience understanding is immediate, continuous, and complete.



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FADE OUT LIVE ACTION SOUND

FADE IN NARRATOR:

NARRATOR (OVER DISSOLVE)
The campaign was quickly mobilized.

DISSOLVE TO:

53. EXTERIOR LOCATION - Medium Shot of public health nurse in uniform distributing literature to school children coming out of school entrance.

NARRATOR:
Public health nurses passed out literature to school children, which explained why they should have their pets inoculated.

54. EXTERIOR LOCATION - Med. Shot of people entering church.

NARRATOR:
Church announcements were made.

55. EXTERIOR LOCATION - Med. Close Shot of man, placing placard in store window - CAMERA HOLDS for placard to be read.

NARRATOR:
Placards were posted, designating the neighborhood locations of the emergency clinics.

56. EXTERIOR - Location - Full figure shot of sound truck travelling up residential street. Stickers on outside of truck announce forthcoming vaccination clinics to be set

NARRATOR:
Sound trucks spread the message through all residential . . .

57. EXTERIOR - Location - business street - same as in previous scene.

NARRATOR:
. . . and business areas.

58. EXTERIOR - Location - Med. Shot of man tacking up quarantine poster to tree. Poster is readable.

NARRATOR:
Quarantine posters were put up, on trees . . .

CONTINUITY SHEET

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ACTION

TRAVEL SHOT - WBGE sound truck traveling up residential street - Stickers on outside of truck announcing — "PROTECT HUMAN LIVES! PREVENT RABIES! HAVE YOUR DOG VACCINATED TODAY! CONSULT YOUR NEWSPAPER FOR LOCATION OF NEAREST EMERGENCY CLINIC.

****

"HAVE YOUR DOG VACCINATED TODAY! THERE IS AN EMERGENCY CLINIC IN YOUR NEIGHBORHOOD! CONSULT YOUR NEWSPAPER FOR CLINIC SCHEDULE".

****

"RABIES IS A FATAL DISEASE! PREVENT ITS SPREAD! HAVE YOUR DOG VACCINATED TODAY! CONSULT YOUR NEWSPAPER FOR LOCATION OF NEAREST EMERGENCY INOCULATION CLINIC."

The shooting script briefly details action and voice continuity.

For shooting, each scene is copied on a separate continuity sheet which gives all the details of action in the scene.

The project supervisor thinks in terms of pictures; but in obtaining information for the script, he frequently works with people who are verbalists. He must constantly evaluate ideas and subject matter in the light of their pictorial rather than verbal possibilities. He must always keep in mind the unique requirements of his medium . . . the film which must move the story forward with every foot and every word. Since it is a different language from the scientific paper or other verbal means of expression, he must seek ways of making the best use of the visual medium and still maintain the same validity as the scientific paper which has greater flexibility for qualification and explanation.

The writer of any motion picture or filmstrip script works within a limited but somewhat flexible pattern. His film must not be more than 20 minutes in length . . . preferably 15 minutes. This time element applies to both motion pictures and filmstrips, and in filmstrips this means as average of about 85 frames. He cannot present more than approximately five basic concepts, and all his visualization as well as his commentary must be devoted exclusively to the direct advancement of these concepts. His budget is limited. He must seek out the

simplest and least expensive methods of translating his ideas to film. He must plan his action to take place in the fewest possible locations; and wherever possible, he must find these locations in or near Atlanta because the expense of travel is a serious limiting factor. He must be sure that the film can be produced within a reasonable period of time. He must be certain that his picture continuity is made up of basic and enduring information, because it is frequently almost as expensive to revise a film as it is to produce it in the first place.

The script is the transitional stage in the translation of an idea to film. In training films it amounts to a distillation of a vast amount of material to a continuity of basic facts which will result in a straightforward and logical visual presentation. It tells the cameraman what pictures to shoot, where and how to shoot them, and indicates how each of the scenes or sequences fits into the story as a whole. Narration in a shooting script is only tentative. It helps to give meaning to the action description and is a rough gage of scene length. But the PICTURE is always the important thing at this stage. In a perfect script, the action would be so delineated that the final film would show exactly what the script described . . . no more and no less. But this seldom happens --- especially in a training film. Scripts are the result of constructive evolution, and generally this evolution continues to some degree through the shooting and editing stages of the film. And, of course, the commentary is not revised finally until the PICTURE has been completed and edited (except in the case of lip-synchronous dialog when both picture and sound are recorded on the film simultaneously).

The routine of script preparation is basically similar for all films whether motion pictures or filmstrips regardless of the subject. The amount of time it takes and the number and type of problems to be solved depend upon the complexity of each subject. A simple procedural film offers few problems because it can be observed directly and checked easily for accuracy. A script of this type can be written in a few days or weeks. Other subjects may require several months.

The creation of a Communicable Disease Center script requires close teamwork from the very start. The project supervisor works throughout the film with the technical advisor who is responsible for the accuracy and sufficiency of

Many minds contribute to the development of every film idea.

the content of the film. Upon assignment of the subject, the supervisor's first step is to consult with the technical advisor and survey with him the material to be included in the film. The technical advisor presents ideas and facts . . . the project supervisor considers the pictorial aspects of the ideas and facts and how they may be arranged and blended to make a good filmstrip or motion picture.

They combine their talents to determine the scope of the film and decide what should and can be shown. Technician and supervisor may make a field trip to observe what the film will depict and to select locations and perhaps make tentative arrangements for cooperation in the production of the film. If further film research is necessary, they decide where, when, how, or from whom the information can be obtained.

At this point, the project supervisor submits a production outline of the proposed film to the Chief of the Story Development Branch. This gives the facts about the film, as nearly as it can be done at this stage. It includes a description of audience, objectives, basic concepts, approximate film length, and cost. The Chief of the Division uses this outline as his basis for approval or rejection for production.

The information about the subject gathered from all sources is studied and integrated by the project supervisor. He resolves all the data he has into four or five basic concepts. Then picture by picture or scene by scene he details the action which will give an accurate representation according to his understanding of the subject. He may first write a treatment or synopsis of the film and then expand this to arrive at his script. If the action is quite technical, he makes rough sketches of his ideas for use as illustrations for the technicians. Whatever his method, he ends up with a preliminary script.

The preliminary script is checked from every angle to ascertain that it is accurate, that it will make a good film, that it will be the kind of film that will be utilized by the intended audience, and that it does not ask for things that cannot be put on film, either by the nature of the subject matter or because of any production limitations that may exist at the Production Division.

The technical advisor checks it carefully for accuracy of content. Generally he asks other specialists in the field to review the script and make suggestions. This usually brings to light any controversial ideas presented in the film and often suggests important things that have been overlooked.

The Chief of the Story Development Branch analyzes the script to make sure that it embodies sound educational principles, and that it will stand up as a good motion picture. He is interested also in checking the probable length and cost with the original estimates. If production problems are apparent, the cameraman and film editor or both are asked to review the script from their standpoint.

The Chief of the Utilization Branch checks the film from the viewpoint of probable use and, based upon evaluation reports of other films in the library, is often able to make valuable suggestions.

The project supervisor gathers all the suggestions made regarding the script and incorporates these ideas in his next draft of the script. Sometimes these suggestions are conflicting or cannot be fitted into the film continuity. However, the supervisor considers them all and uses his own judgment in selecting those that will make the best film presentation. Usually the film is checked again with the technical advisor after these revisions have been made to make sure that there are no inaccuracies in the script.

Every film subject presents different problems both from the script and production angles, but certain basic things have to happen in every case. In writing filmstrip and motion picture scripts for the training of scientists, the writer himself must use scientific methods. He must first seek the facts, and through consultation with qualified specialists, check and recheck their validity for use in the film presentation. He uses every means available to him to make sure that not a single frame in the film is inaccurate or misleading. If he succeeds in these things and meets the technical requirements of good film production, his script is ready to go to the cameraman for actual production.

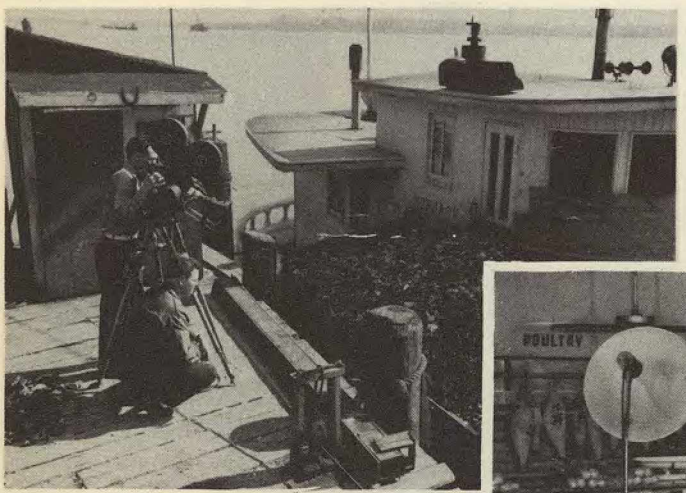
How a Shooting Script Becomes a Motion Picture

HARRY A. SHERRILL, IN CHARGE STORY DEVELOPMENT BRANCH

A shooting script is like a detailed map that guides the traveler on his way. A script tells much, but by no means all, of what is to be done and how to do it. It calls for locations which have to be found and for which arrangements have to be made: for sets which have to be built and furnished with the necessary properties. It calls for action in which people and equipment are needed. It calls for the expenditure of money which must be accurately estimated and a budget made and adhered to in the production of the film. Above all, it calls for the close coordination of the skill of many people --- photographers, editors, laboratory technicians, sound engineers, artists, actors, project supervisors, and others.

The project supervisor follows through with the production from this point as the coordinator of the production activities and as director of the film. A camera crew is assigned to work with the project supervisor on the production. It is their job to put on film the scenes that the project supervisor has written into the script.

The first step in production is what is called "a script break-down." The project supervisor and cameraman analyze the script from a shooting standpoint. They group together all the scenes that can be made from a specific camera location. This is very important because it generally takes longer to set up the camera and arrange the lights than it does to shoot the scene. The object is to organize the shooting



It was necessary to travel to Norfolk, Va., to get this exterior location shot.

Lighting is a problem on interior location sets such as this one.

so that there will be as few changes of location as possible.

The script break-down is accomplished by means of continuity sheets. Each scene of the script is copied on a separate sheet. This not only makes it easier to group scenes together for shooting convenience; it makes it possible to make a record of all the details of the scene as it is shot, so that if a retake of the scene is necessary all the information will be available to set up identical shooting conditions. These sheets are used also by the film editor in cutting the film.

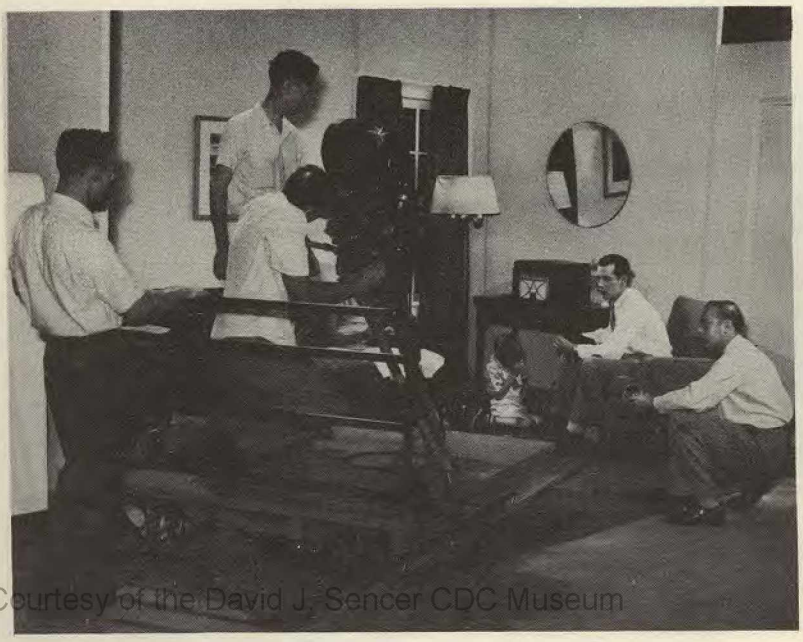
As soon as the script break-down is completed, the cameraman requisitions all the film he needs for shooting the picture. He generally asks for about three hundred feet for every hundred feet which will be in the finished film. This allows film for retakes or for scenes which were not included in the script but which may prove to be necessary as the shooting progresses. In the meantime, the project supervisor selects locations and arranges shooting schedules. Generally, the cameraman and project supervisor inspect the locations to check on production problems such as availability of electric current, the number of lights, and other equipment needed for shooting the scenes at this location.

If the film is to be shot on a studio set, shooting dates are scheduled at the studio. Sets are built and all the properties and equipment are obtained and arranged on the set as required by the script.

Certain scenes may require graphs, charts, maps, or animated sequences which are to be done in the Graphics Department. The project supervisor discusses these scenes with the artist who has been assigned to the job so that the art work required for the production can be in progress while the live action in the film is being shot. Titles are generally ordered at this time also.

After all these arrangements have been made, the camera crew is ready to shoot the picture. On the set, the camera crew consists of the cameraman, assistant cameraman, script clerk, and the project supervisor. Frequently a sound technician is required and, if the scene is complex, other helpers are often needed. The cameraman and project supervisor together plan the shooting. The project supervisor explains the exact action and effect that he wants to get on the film. The cameraman and his assistant set up their lights and locate their cameras to achieve this effect.

The scene is then photographed. If any error appears in the action, the scene is repeated



Many types of interior sets can be built at the studio.

Raw film stock is requisitioned from the stockroom to cover the needs of each film.

until the cameraman and the supervisor agree that the scene is right. During the shooting, the script clerk makes notes of what takes place. Each scene is slated with the scene number for identification in editing. If the scene was not good, an "N.G." slate is inserted at the end of the scene so that the editor will know this "take" is not to be used. If any action is photographed which does not appear in the script, a record of it is made on the continuity sheet. The time it takes to shoot a scene depends entirely upon the kind of scene it is. It might take a full day to shoot a scene that runs a few seconds on the screen; but on the average, a camera crew can shoot about 20 scenes a day.

At the end of the day's shooting, all of the exposed film is sent to the laboratory for processing. Because the entire expense for actors, crews, and materials is represented by this exposed film, as is also the quality of all future prints to be made from it, the quality of processing must be insured by precise controls. Film of the same emulsion number is exposed in a sensitometer, processed in the developing machine, and then a graph of the results is plotted from readings on a densitometer. This graph, called a characteristic curve, indicates what changes, if any, should be made in the processing procedure in order to secure the right density and contrast for the highest quality in the negative.

The negative is developed and a workprint is made. First priority is given this footage at the laboratory. This footage, which is called the "rushes," is reviewed as soon as it is available --- usually the day following the shooting. If any retakes are necessary, these scenes can be shot before the set is changed. When the shooting is completed, the cameraman, editor, and project supervisor review the rushes. Together they decide which is the best of each scene. The editor then cuts the workprint. The selected scenes are put in sequence. No effort is made at this point to cut each scene to length. With the film in sequence, the project supervisor and editor review this workprint again. (The original negative is never touched until the editor has cut this workprint exactly as it should be in the completed film.)

The average person assumes that once the picture is shot the work is almost done; but for the average film, it generally takes 2 or 3 months to do the remaining work required to make a motion picture.

The editor's job is not merely one of putting one scene after another. This, of course, is a first requirement; but each scene must carry the action forward smoothly and with the right

Motion picture film is processed in automatic developing machines.

Most of the art work for CDC productions is done in the Graphics Department.

The animation stand is used for shooting titles, charts, maps, and animation.

amount of emphasis. This requires a very keen perception of what the action means, an accurate sense of timing, and experience in blending one scene with another. The editor can make a great film out of mediocre footage or a poor film out of superlative footage so, although editing is one of the most time-consuming of operations in film production, the finished product generally proves that this time is well spent.

When the editor has the scenes in sequence and cut to length, the next step is to indicate the transitions between scenes. This is accomplished by what is known as optical effects. Optical effects serve the same purpose in a film as punctuation does in written literature. The most common transition between scenes is the simple "cut" which is roughly equivalent to the sentence. To carry the comparison further, "fading out" one scene and "fading in" another would be the equivalent of a chapter; while such things as the "lap dissolve" (blending the end of one scene with the start of the next by visible overlapping action), "wipes," and other optical effects serve to separate or blend the action in varying degrees.

When the workprint is in its final-edited form, the tentative narration of the script is very carefully checked against the action. The commentary is revised sentence by sentence and word by word so that it exactly matches the picture to which it refers. Any commentary which is unncessary because the picture tells the story completely, or commentary which does not refer specifically to the action on the screen is eliminated. Involved or subtle sentences are simplified.

The picture is then projected and the narration read to it to be sure it achieves the desired effect. If no corrections are necessary, a recording is made by a professional commentator. The sound is recorded on a separate negative from that on which the picture appears. If music or other sound effects are included in the film, these additional effects are recorded on another negative. The editor then synchronizes the sound print with the picture print.

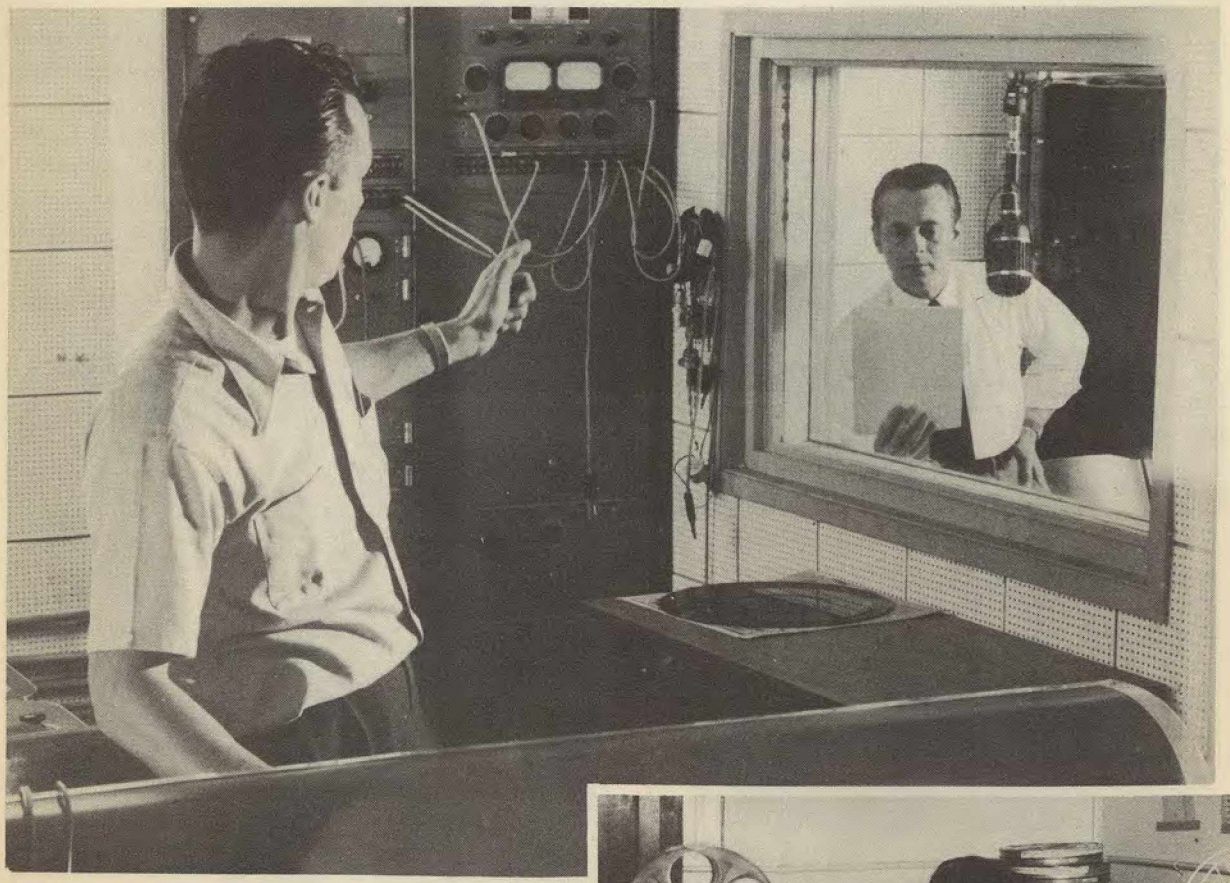
At this point, the film is ready for a preliminary showing to the technical advisor and others for approval. This is known as the "interlock" showing since it is necessary to run the picture on one projector and the sound track on another. At this stage minor corrections can be made without much trouble or expense. If this interlock print is approved, the editor cuts the

Each scene is slated with the scene number for identification in editing.

Precise film processing controls are maintained. The technician is using a densitometer to read densities of each step of a sensitometric strip which has been exposed on the sensitometer in the right foreground.

The first step in editing is to put the scenes in sequence.

The second step in editing is to cut the scenes to length and blend scenes so they have smooth continuity.

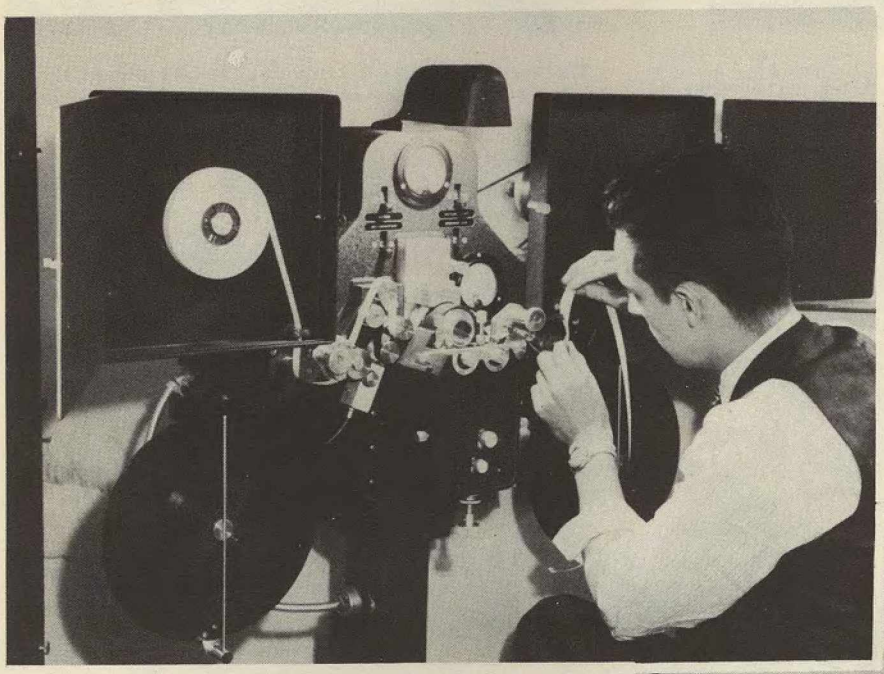


Sound is recorded in a completely equipped sound recording studio.

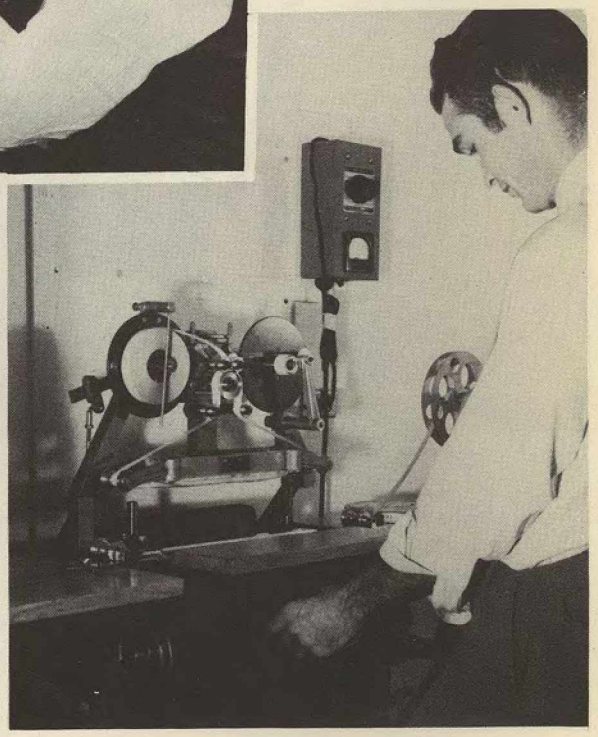
Sound and film are on separate negatives. The editor synchronizes the two negatives.

original negative to match the workprint exactly. The sound negative also is cut and matched with the picture, and composite prints are made which include both sound and pictures on a single negative. After a master positive is made for safekeeping, release prints are made from this composite negative.

The laboratory takes over at this point. Before a negative is printed, the best exposures for the different scenes are determined on a special form of sensitometer called a motion picture timer. When the motion picture printer is set according to the readings for the best exposures as determined by the timer, it automatically corrects any unevenness of exposure in the different sequences. The same negative, of course, is used to make a large number of prints. When the release prints are finished, they are delivered to the Film Library for distribution.



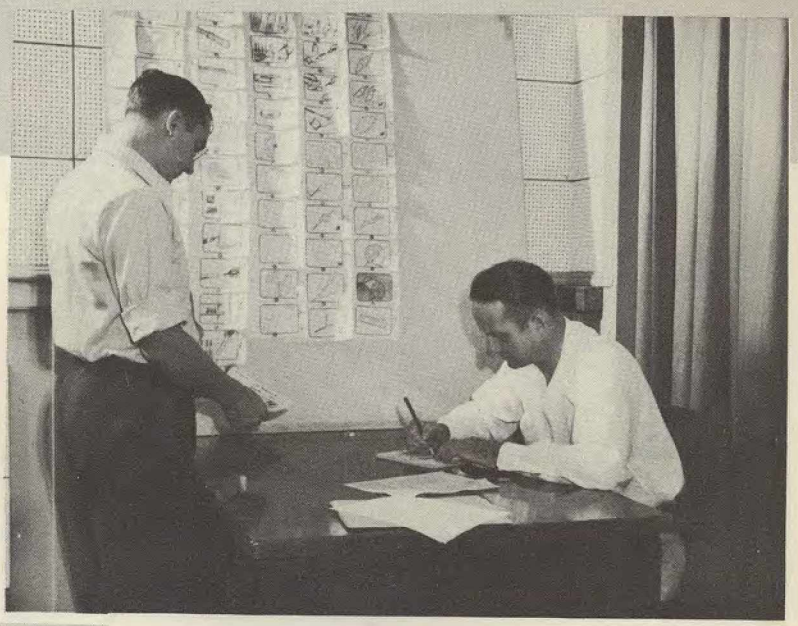
This motion picture film printer makes release prints from the original negative.



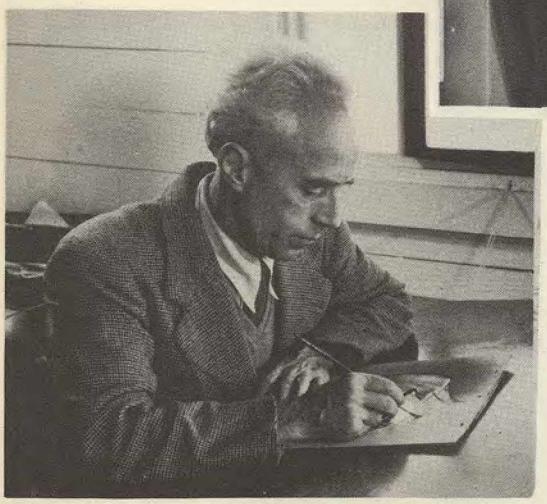
Printing exposures for negatives are determined on the motion picture timer.

From Film Script to Color Filmstrip in 16 PICTURES

EVERETT L. PRIEST, IN CHARGE
EDUCATIONAL METHODS SECTION



1. In order to convey his picture requirements to the artists and cameramen, the project supervisor makes a rough lay-out drawing for each scene in his script. The technical advisor assists by checking the suitability and accuracy of each sketch.

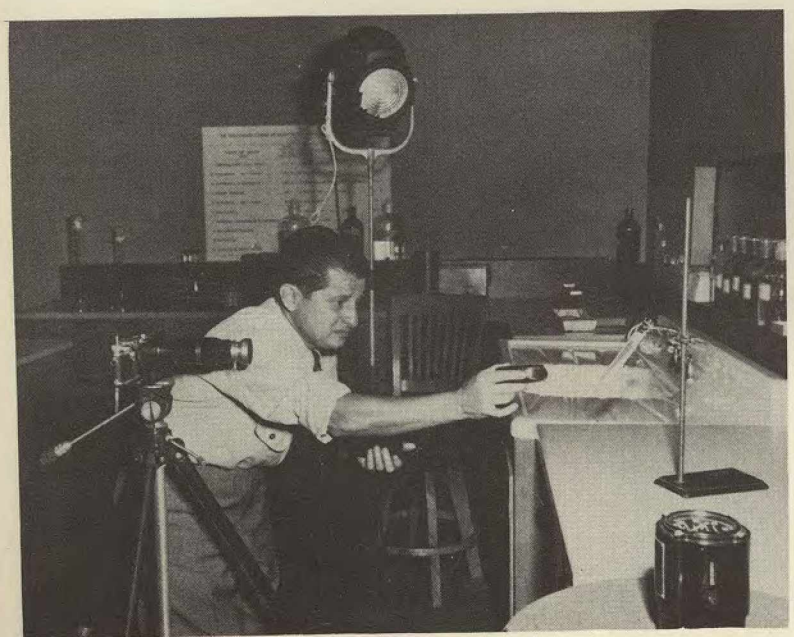


2. Using the lay-out sketches for orientation, and his knowledge of anatomy for accuracy, the scientific illustrator supplies drawings called "story boards" whenever they are necessary to delineate concepts which cannot be photographed.

3. Any distinguishing characteristics of the specimen may be emphasized in these pictures. Sometimes the thought may be presented best even by a cartoon or caricature, and several entire filmstrips are of this type. The illustrators must know just how well the different colors they may choose in harmony systems will reproduce on the color film being used.

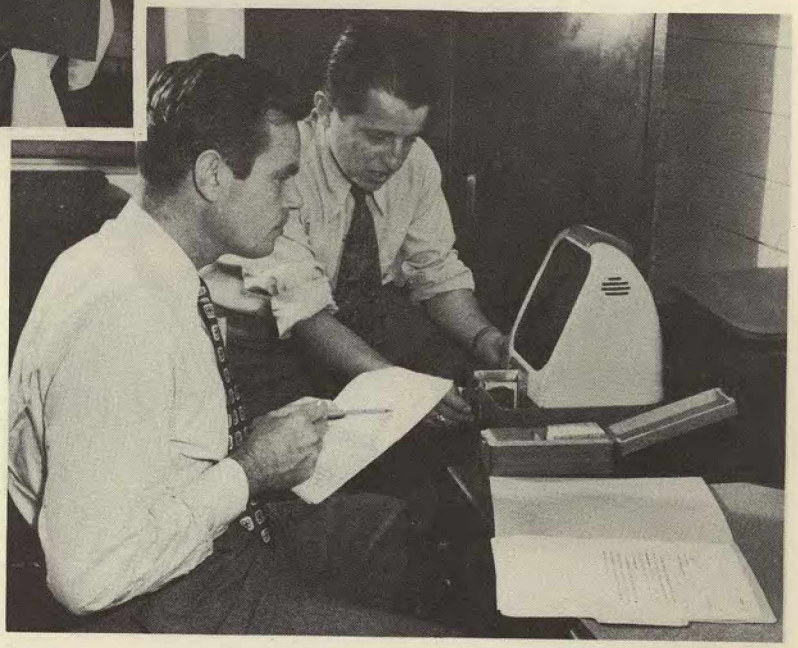
4. Often the drawings are made and colored from observation of the specimen through a compound microscope.

5. Or, if photomicrographs will serve, the tiny specimen can be photographed directly with color film in a professional 35 mm. camera, thus saving the time of the scientific illustrator.

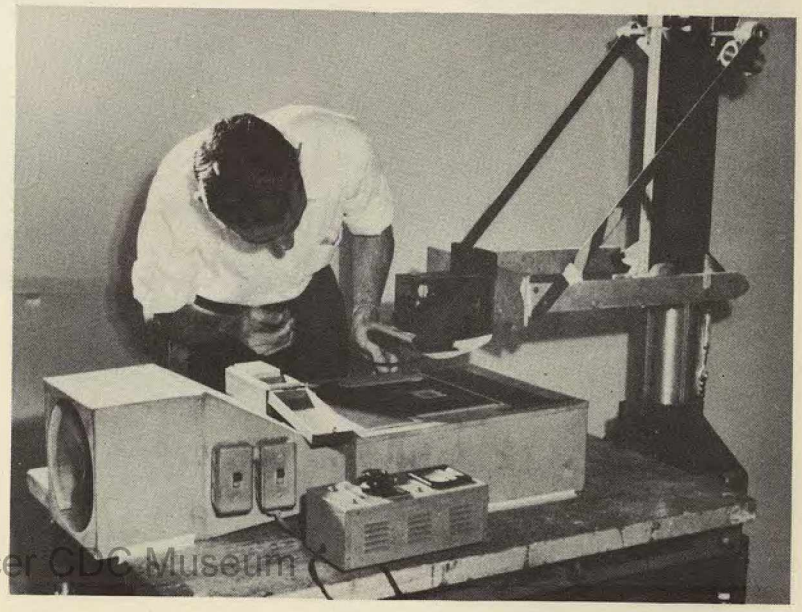


6. Laboratory and field scenes may also be photographed directly on color film in this camera. Regular press type or view cameras are sometimes used, but the expense is greater.

7. By copying with the same professional 35 mm. camera and color film, graphics are reduced to the size of the direct photographs.

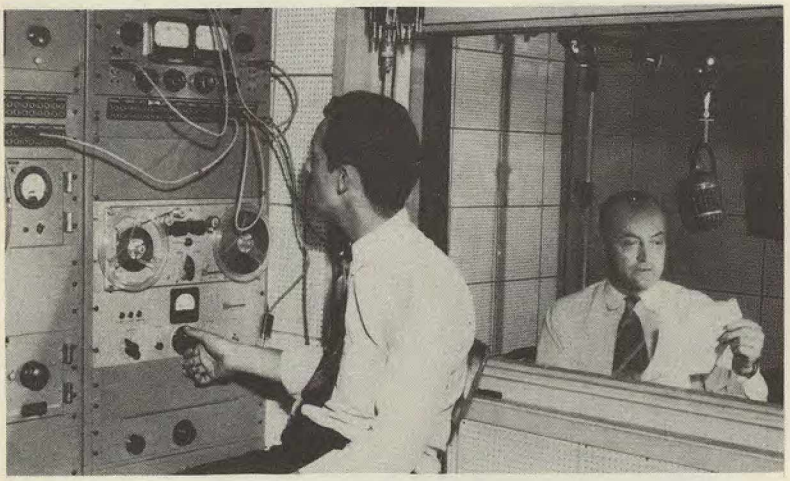


8. As soon as the film is processed (either in the Production Division or by its manufacturer), it is turned over in the form of 2x2-inch color slides to the respective project supervisor and to the chief of the Filmstrip Section. They together choose the appropriate slides for the complete strip and put them in the correct order.

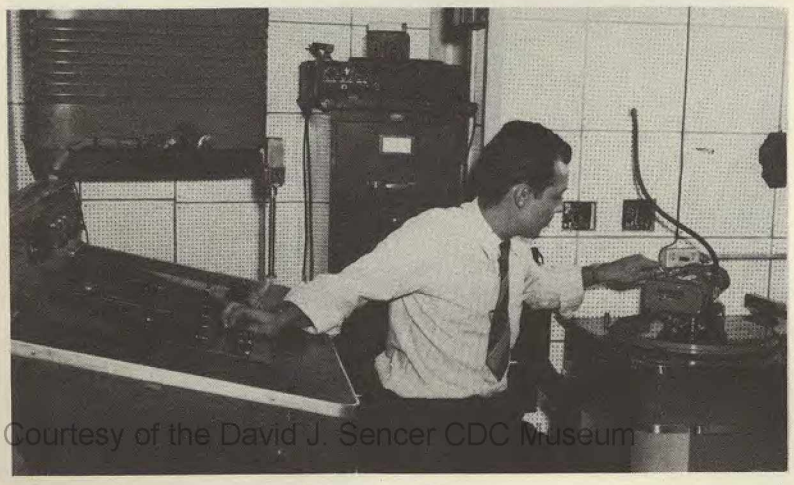


9. A technician carefully copies the slides in the correct order by means of color film in a single-frame 35 mm. camera. This work is greatly facilitated by the special copying box shown in use here and designed by the Filmstrip Section.

10. The technician processes the film in the darkroom and obtains a master positive of the complete color filmstrip.



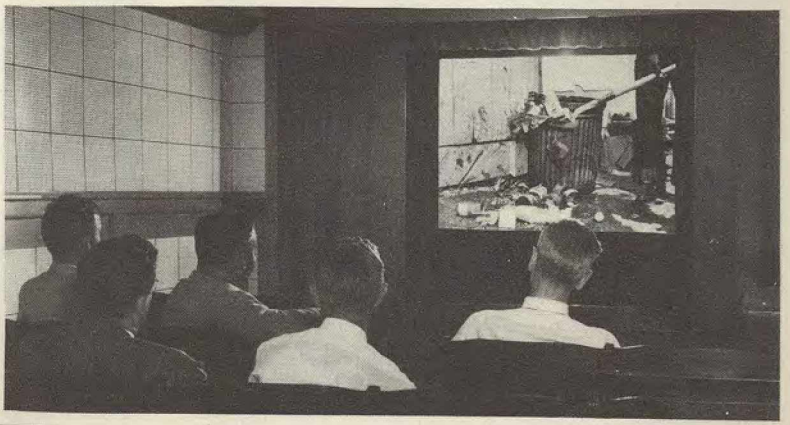
11. In the meantime, a narrator, under the supervision of a sound engineer, records the verbal accompaniment on a tape recorder.



12. From the tape recorder, the voice is later transferred to a 16-inch, 33 1/3 r.p.m. master record. The newly installed console enables the sound engineer to control the volume and quality of the sound.

13. In the projection, both the master color positive and the master recording are made ready for the reviewing committee.

14. The reviewing committee, usually including administrative officials of the Production Division, the project supervisor and technical consultant concerned, and technical men from the sound and the photo laboratory, either approve or disapprove the quality of the sound and pictures.



15. After approval, the master color positive is threaded as a loop on a motion picture printer and as many copies as desired exposed on 35 mm. color film. Both this exposed film and the master record are sent to outside laboratories for the desired number of reproductions.

16. After the required number of copies of the filmstrip and record are produced, they are placed in the film library pending distribution on one of the several types of loan available from CDC.

Reaching THE INTENDED AUDIENCE

MERLE I. WIMMER, IN CHARGE
UTILIZATION BRANCH

A public health agency, a group of people, or a person conceives an idea, has a story to tell, a message to deliver. When this has been translated into a visual form, such as a motion picture or a filmstrip, it is ready to assist in accomplishing the intended objective of informing or instructing people. The mechanics for getting such information to the ultimate consumer are not simple.

DISSEMINATION OF INFORMATION

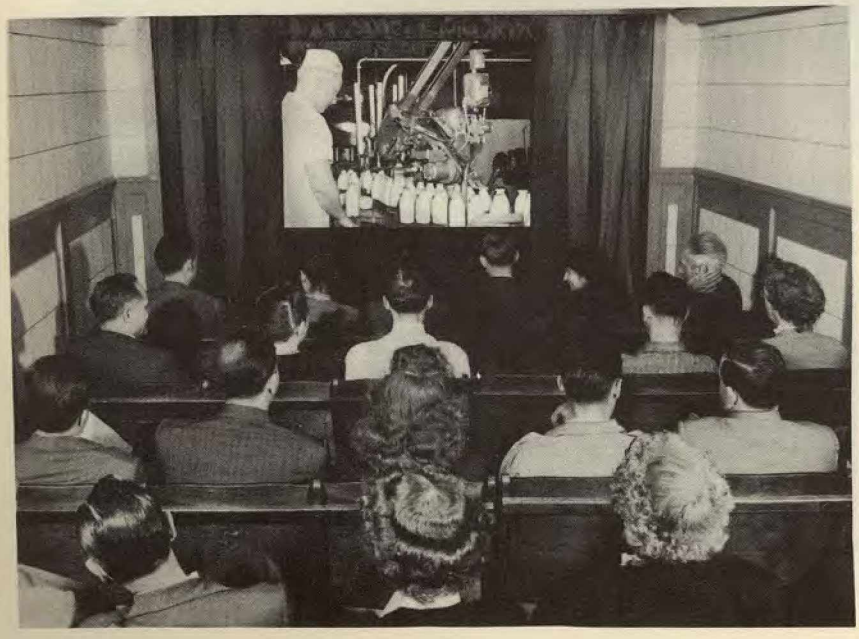
Dissemination of information involves constant planning on the following phases: (1) formulation of distribution policies; (2) release announcements; (3) distribution; (4) maintaining stock levels to meet demands; (5) development of audio-visual methods as applied to public health; and (6) constant improvement of production through evaluation.

DISTRIBUTION POLICY

A distribution policy was instituted for the purpose of reaching the widest possible audience with the best service. By such policy, films are made available to all persons or groups, domestic or foreign, concerned with solution of problems of health on a professional or subprofessional level. The intentions are that films shall reach all CDC activities, all State and territorial departments of health, schools of public health and preventive medicine, schools of medicine, physicians, schools of sanitary engineering, interested government industrial groups, and colleges and universities offering courses in other biologic sciences. Service to similar groups in foreign countries is cleared through the U. S. Department of State.

RELEASE ANNOUNCEMENTS

In order to reach the prospective users with sufficient information as to availability of films, a great number of professional journals and other media are used. If a new release has particular significance for sanitary engineers, it is announced in engineering journals. Likewise, a release of interest to veterinarians is announced in veterinary journals. Other publications employed are those of the American Medical Associa-



The story told by the film must reach the intended audience.

Catalogs, instructor guides, and other utilization materials are prepared and distributed by the text writers of the Division.

All initial distribution is done by the film library which is maintained by the Production Division. Many short-term and special loans are also made from this library.

tion, the American Public Health Association, and sanitarian publications. Full-page pictorial reviews of both extant and new films are included in each issue of the CDC Bulletin.

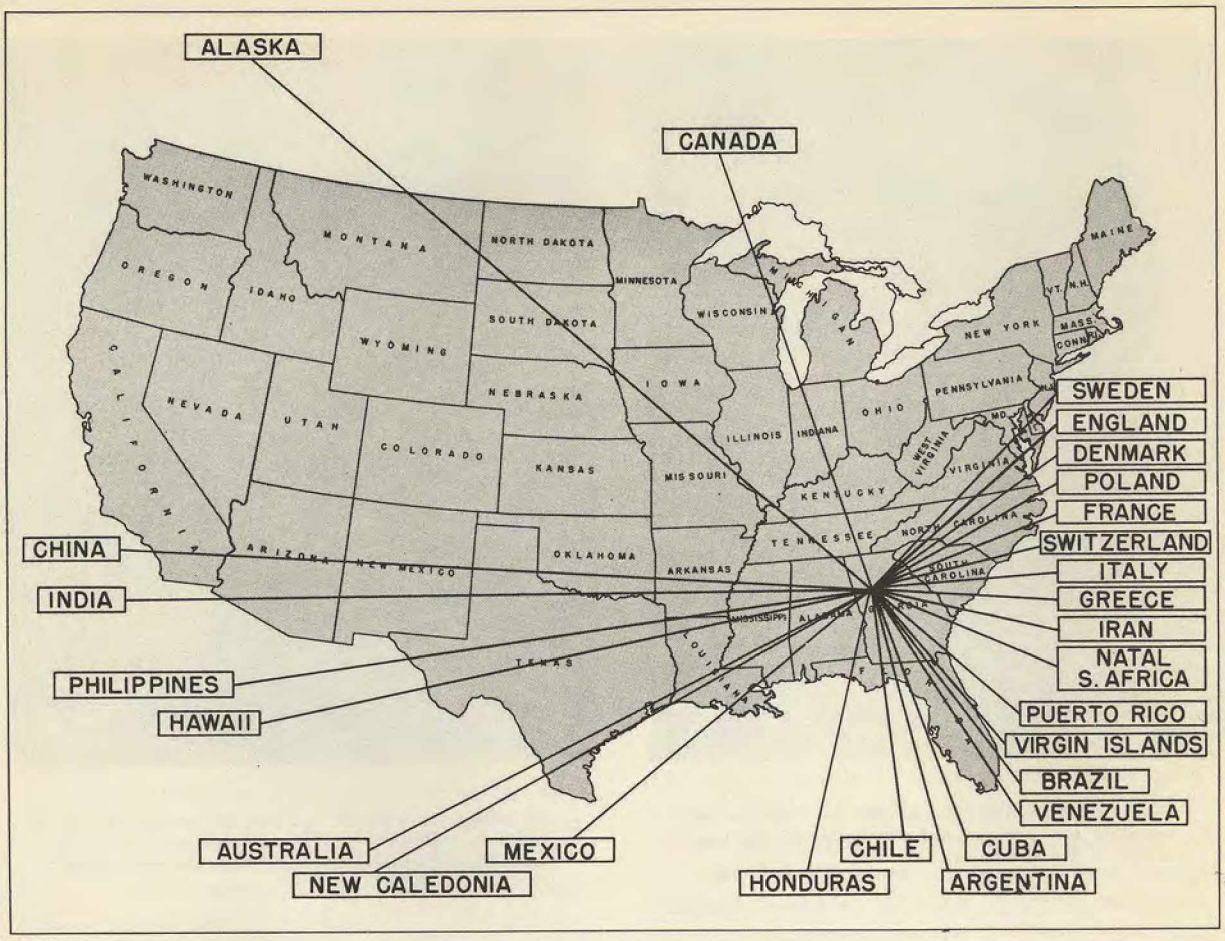
The Film Catalog-Utilization Guide is the chief instrument prepared by the Production Division for dissemination of information. This is a loose-leaf catalog prepared in units, consisting of information on audio-visual methods in education, loan and sales regulations, evaluation techniques, and an individual illustrated catalog page for each film. Each catalog page gives a physical description of the film, purpose, intended audience, and the basic concepts covered in the film. Film selection and correlation are simplified by use of these pages. The publication may be obtained by request.

Personal contact in the field and visitors to the Division serve as valuable means of dispersing information. A large majority of the films sent to foreign countries is the result of the great number of foreign visitors who come to the Production Division.

The available information leads to requests for service from widely scattered areas of the world. At this point distribution begins.

DISTRIBUTION

A film library is maintained for handling the physical aspects of distribution and maintenance. From this film library, films have been shipped to all States and territories of the United States and a considerable number of foreign countries as indicated by the accompanying map. In accordance with the distribution policy previously mentioned, the film library offers free loan of films on the following bases: (1) indefinite loan --- when the frequency of use justifies continuous loan; (2) short loan --- when the need is temporary; (3) special loan --- when there is a special training program under way



CDC films have reached not only all the States but also the areas here indicated, and their distribution is rapidly expanding to other areas. Redistribution is made from practically all of these points.

in which the films are needed more than 30 days but not indefinitely.

Centrally located offices, such as State and regional offices, are eligible for indefinite loan of CDC prints and can list them for redistribution at their discretion.

Many activities take advantage of the opportunity for advance bookings. Better service can be rendered by the film library as more activities resort to advance bookings. The minimum advance notice for satisfactory service is 2 weeks.

Maintenance includes film care and provision for proper stock levels. Each time a print is received from the field, it is inspected, repaired, and cleaned before it is returned to the files. In order to supply the needs, a fairly large number of prints is purchased on the initial order. Reorders are placed as needs occur.

After the planning to get the film into the hands of the user, there is the problem of improving methods of presentation.

AUDIO-VISUAL METHODS

It is a well recognized fact that a large majority of the persons who use films have not had formal training in audio-visual methods of instruction. Normally, a film cannot do a complete job of teaching by itself. Therefore, it needs the help of the instructor, as much as the instructor needs the help of the film. For these reasons it is necessary to prepare utilization materials to precede and to accompany the films. The special catalog pages which

Utilization materials precede and accompany films. They serve as a guide in selection, correlation, and presentation of films.

precede the film assist in selection and correlation. The utilization section of the catalog gives generally accepted methods of film presentation. The instructor guides which are being prepared for each major production give specific suggestions for presentation of a specific film. These guides help the instructor to integrate the subject matter with the curriculum and the basic knowledge of the trainee.

The instructor guides follow essentially the same plan as those used by other government agencies and commercial producers, but certain adaptations are made to fit them to the needs of public health. The chief function of these guides is to assist the instructor in making his plans for presentation. They can serve as an aid for planning the simplest to the most complex presentation. If the plan of presentation is simply one of showing the film and following with a brief discussion, the basic concepts around which the discussion should be built are briefly stated in the guide.

The guides are built principally for use in normal teaching situations. They are broken down into the following elements: (1) objectives, (2) intended audience, (3) survey of major and minor concepts, (4) notes, (5) utilization, (6) follow-up, and (7) references.

Utilization is broken down into: (1) preparation, (2) basic principles to be observed, (3) presentation, and (4) follow-up.

One film may be used with one audience for accomplishing one objective, while with another type group it may assist in accomplishing another objective. In either event, it should be used only when it will fill a definite need.

CDC films are prepared specifically for the groups given under DISTRIBUTION POLICY, but often have secondary values for information purposes with other groups. However, disappointment can usually be expected when a film is used with the wrong group.

The survey of major and minor concepts is essentially an outline of the subject matter covered. This subject matter is carefully analyzed and arranged so that the instructor can easily determine the basic concepts and the specific concepts which are used to develop them.

By use of this outline the instructor can determine what areas of subject matter need to be treated by use of supplementary aids and additional information. The basic concepts portrayed should be used in preparing the group and directing their observation as the film is shown. With these concepts in mind, the trainee is able to organize the factual material of the film in his own mind. This outline will also help the instructor to make both subjective and objective tests if there is none included in the guide, or if there is one included but he does not wish to use it.

Under the heading of utilization, specific suggestions are given for preparation and presentation. Dividends from the use of films are usually in direct proportion to the amount of effort and planning. Learning is directly related to motivation. Since CDC films make a direct approach to the subject matter, a major portion of the motivation must come from the instructor before the film is shown.

The instructor must prepare himself by thoroughly familiarizing himself with the content of the film and he must make careful plans for presentation. He should motivate the students and direct their observation by use of the basic concepts listed in the guide. He should show the film under the best possible conditions. The follow-up after the showing provides for clarification of concepts, summary, testing, and application. Since the follow-up varies so much with the situation, specific follow-up activities are not always given. Tests, discussion questions, and references for supplementary reading are usually included.

Each instructor is left to his own devices in determining what procedure he shall use; but whatever the procedure, it must be carefully planned if desirable results are expected.

In order to further acquaint public health workers with these tools of modern education, audio-visual courses are offered periodically. During these courses, trainees are given instruction in methods, administration, equipment operations and maintenance, and production. Each trainee is given ample opportunity to develop skills by actual performance.

Lectures and demonstrations on audio-visual methods are given to various types of classes in session at various training activities and at both large and small public health meetings.

By use of all these approaches, utilization has been greatly improved, but much remains to be done.

Audio-visual courses are offered for training public health personnel in audio-visual methods. The emphasis is placed on DOING.

Exhibits of many types have been prepared and displayed at major public health meetings throughout the United States.

EVALUATION

Evaluation in its simplest form is any method of appraisal by which the worth of any object or idea is determined. The worth of an audio-visual aid can be discovered only by determining the degree to which it aids in accomplishing a predetermined objective.

Evaluation serves as a quality control for the audio-visual materials involved. Prerelease evaluation provides for accuracy of content, suitable subject matter organization, and control of physical qualities of the various media. Postrelease evaluation affords information for improvement of future productions and the necessary guidance for revision or withdrawal of existing releases which may have become partly or totally obsolete due to new discoveries and changing procedures in operational activities.

Prerelease evaluation serves to present an evaluation print of a film to the type of audience for which it was prepared. Audience reaction to these prints often brings to light some last-minute changes which will increase comprehension of certain concepts. At this stage of production, all the technical personnel involved have an opportunity to make a final examination before release prints are made.

Postrelease evaluation provides information as to how well the aid has served in the actual situation. Since so much research has been done to prove the superiority of audio-visual materials over traditional methods of teaching, most of the postrelease evaluation amounts to personal opinion polls in the form of utilization reports provided with the training materials. In addition, a 10-point evaluation form is included on the back of each catalog page for instructor use.

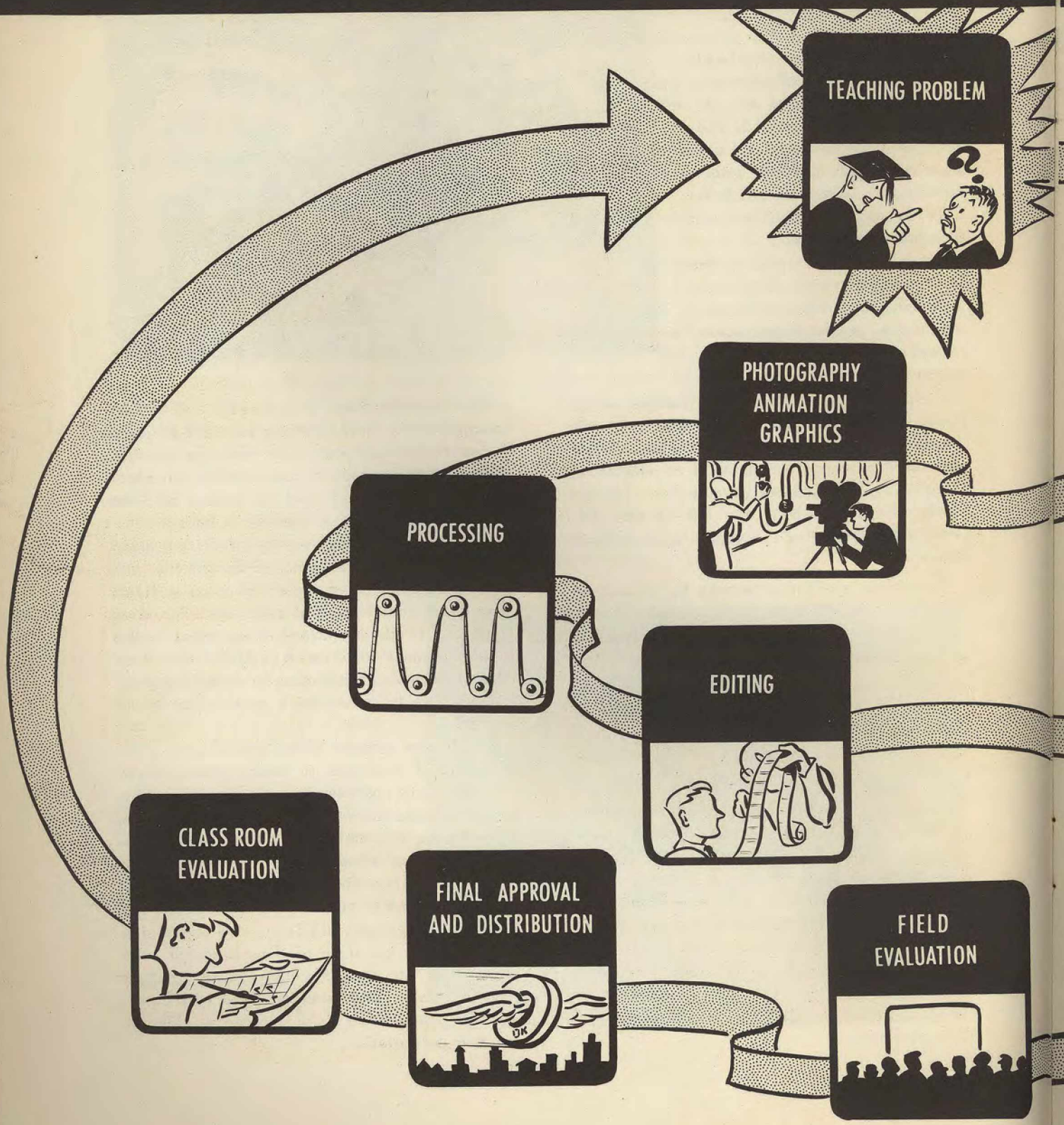
The constant flow of unsolicited letters coming from the field serves a valuable purpose. These letters are extremely welcome whether they contain praise or constructive criticism. Revision, withdrawal, and production of films may and often do result from these letters.

Program evaluation provides information as to the scope and progress of distribution and utilization and brings neglected areas to light. The actual contribution of audio-visual training materials to the solution of the total health problem cannot be measured. But that they make a valuable contribution to training personnel who are to solve these problems is not disputed.

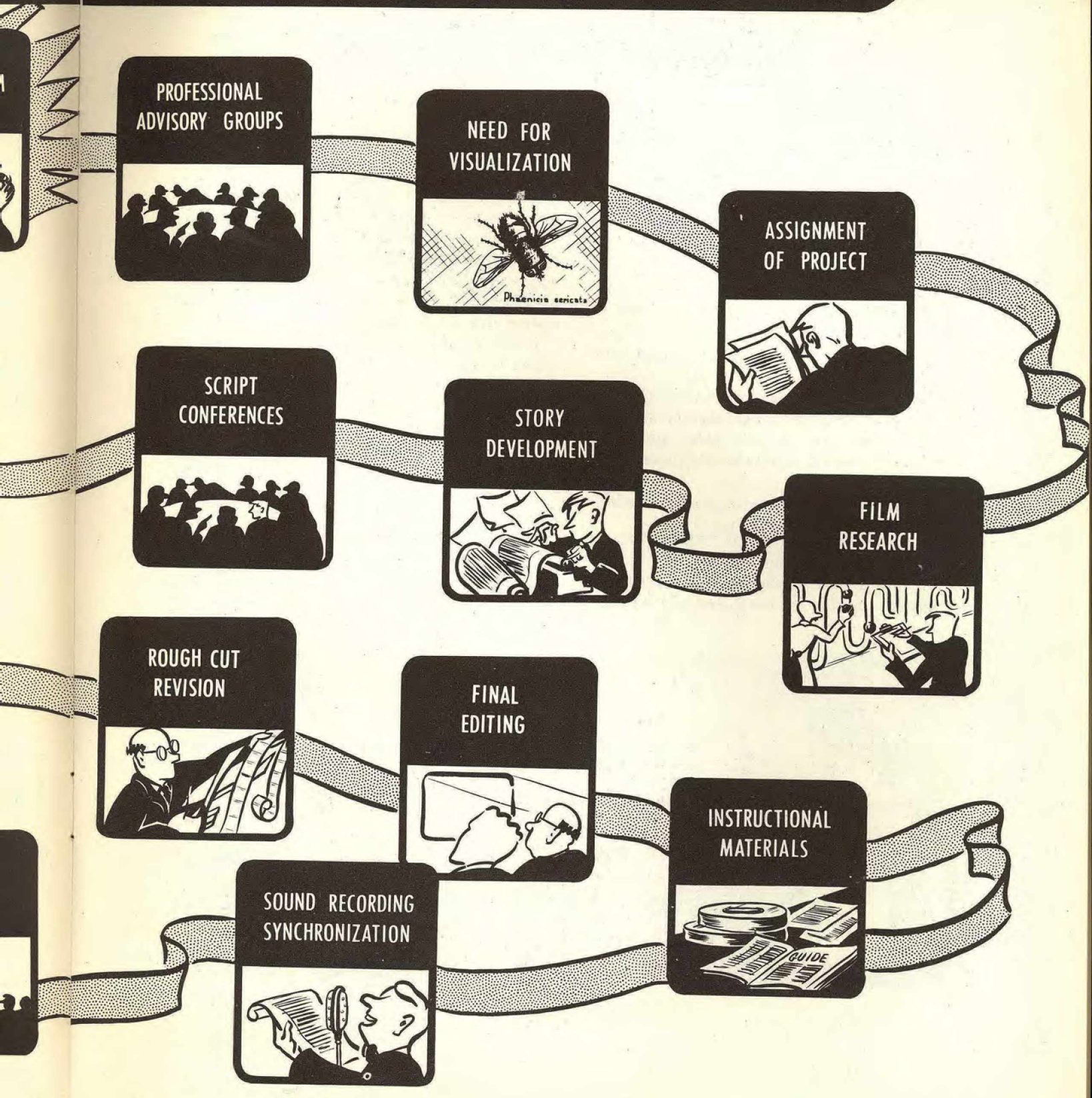
Finally the purpose of utilization is to guide audio-visual materials to their appropriate destination, to improve methods of presentation, and to evaluate the results obtained by their use.

Following this article is a two-page orientation chart illustrating the sequence of activities in the Production Division. From this chart it is apparent that it takes much time, effort, and planning to prepare audio-visual training materials and get them to their intended audience. They are not self-teaching devices; therefore every person using them will be rewarded in proportion to the degree of planning for their presentation.

THE PLANNING & PRODUCTION



ON OF A CDC FILM . . .



CDC Medical and Dental Service

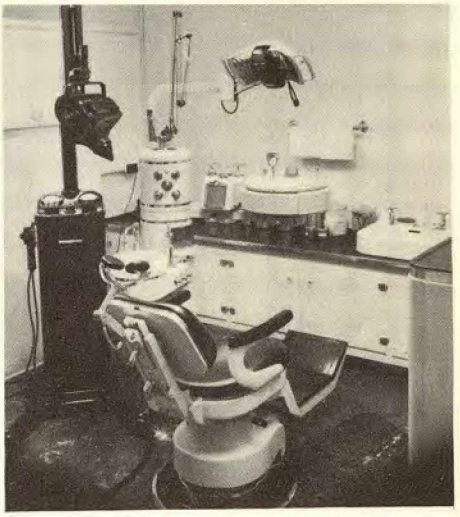
The Medical and Dental Service of the Communicable Disease Center is a service to promote and maintain physical and mental fitness through:

(1) Treatment of on-the-job illnesses and dental conditions requiring emergency attention.
(2) Preemployment and other diagnostic examinations.
(3) Advisory diagnostic services directed at the early detection of disease or disorder and followed by suitable treatment through referral to private physicians and dentists.
(4) Preventative programs relating to health.

Thus the Medical and Dental Service, housed in 14 rooms in the Rialto Building in Atlanta, now provides a well-rounded program of medical and dental care for commissioned officers and their families, and the preventative and emergency treatment mentioned for its Civil Service employees. As a preventative program against dental caries, all children of CDC officers and employees between the ages of 3-18 are eligible for the topical application of 2 percent sodium fluoride solution.

In charge of the Medical and Dental Service, which is a unit of the Executive Office, is Dr. Frank W. Nelson, who is also Chief Dental Officer. Dr. Nelson, a regular corps dental officer, was stationed at the U. S. Public Health Service Dispensary in Washington prior to his assignment to CDC.

Dr. Nelson has instituted a program of producing dental audio-visual training aids. A filmstrip entitled "Oral Hygiene" has been released. This filmstrip, together with additional material when released, will be available on a loan basis from the CDC film library.



Transportation Plan Board

SPECIAL PROJECTS

EMERSON R. BAKER, SANITARIAN (R)

The photo below illustrates a control board useful in keeping current location records of automotive equipment.

This particular board is approximately 2 x 3 feet. It is suitable for a fleet of from 100 to 150 vehicles. Each round tag represents one vehicle and has the Federal Security Agency license number on the front. The make, year, and capacity of the vehicle are listed on the reverse side. The tags, of different colors, are 1 inch in diameter and are metal rimmed. They may be placed about the board as necessary by removing them from the open screw-eyes. When the vehicle is transferred from one location to another, the tag is placed in accordance with the proper location.

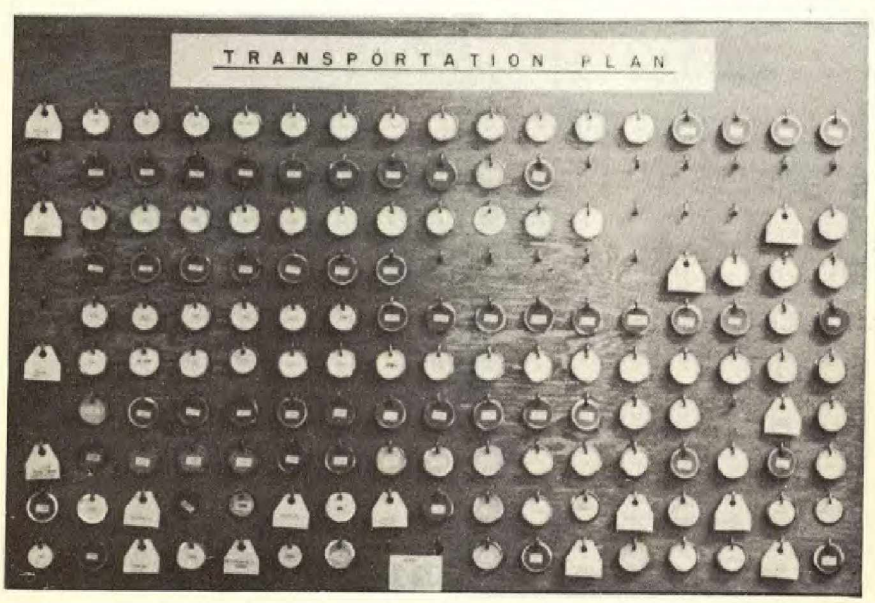
On this plan the colors represent the various types of vehicle bodies --- for example, white for a ½-ton pick-up; red for a 4-wheel-drive ½-ton Army vehicle; and yellow for a 1½-ton stake. However, if the needs of a specific activity require it, this scheme can be altered so that the colors represent other information ---for example, year, make, model, and capacity.

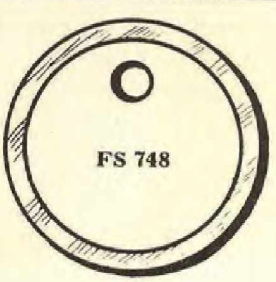
A plan board, such as pictured here, is useful to any operations office which directs vehicle assignment, property accounting, or general equipment information.

The irregular, roof-shaped tags represent the location (and property accountability) records for any group of vehicles assigned to area supervisors (or city, county, project, or individual personnel) responsible for the equipment.

This particular chart shows, on the first two lines, an area supervisor charged with 26 vehicles. The first 12 (white tags) are ½-ton commercial pick-ups; the next 4 tags (green) represent ¾-ton pick-ups; the next 8 tags (red) represent 4-wheel drive ½-ton Army vehicles; the next one (yellow), a 1½-ton stake-body truck; and the last tag (2d line), a station wagon.

The plan board is being used successfully by Communicable Disease Center activities in some States.





Veterinary Protozoology

BANNER B. MORGAN and PHILIP A. HAWKINS

1948, pp. 1-195, Published by Burgess Publishing Company,
426 South Sixth Street, Minneapolis 14, Minn.

Veterinary protozoology has become increasingly important during the past few decades, so it is timely that a textbook dealing exclusively with the protozoan diseases of veterinary importance in North America should be published. This book is the outgrowth of teaching materials that the authors have used in courses on the subject at the University of Wisconsin and Michigan State College.

After an introductory chapter devoted to the general aspects of protozoology, separate chapters are presented on the protozoa of the horse, cattle, sheep and goats, swine, dog and cat, poultry, and fur-bearers. The clear, concise presentation of the morphology, life histories, pathology, diagnosis, treatment, and control of the parasitic protozoa will be appreciated by the practicing veterinarians and others concerned with this field of parasitology. All four classes of protozoa have representatives that are found in most of the domesticated animals discussed. The flagellates and sporozoa are the ones that are most frequently incriminated as the cause of diseases. The amebae are relatively unimportant and, although the ciliates are found in great abundance in some of the hosts, apparently they are harmless. Poultry seems to have the greatest opportunity of being adversely affected by the protozoa, and species of Coccidia are probably the greatest offenders.

The book contains 24 excellent plates with large illustrations of the various protozoa discussed. A number of the figures have been redrawn from other authors, but many are original with this publication. Unfortunately, there are no references to the figures in the written text, which fact may be a handicap to some students. Three maps present the distribution of dourine anaplasmosis and *Boophilus annulatus* in the United States.

A brief chapter on the diagnosis of the protozoan diseases presents many of the standard parasitological techniques. The appendix includes a parasite-host list, treatment schedules for the most common protozoan diseases, a list of important books and journals, and a bibliography of 309 articles of interest to veterinary protozoologists.

Dr. M. M. Brooke, S.A. Scientist

Streptomycin Sensitivity Testing

ROBERT A. PATNODE,
S. A. SANITARIAN (R)

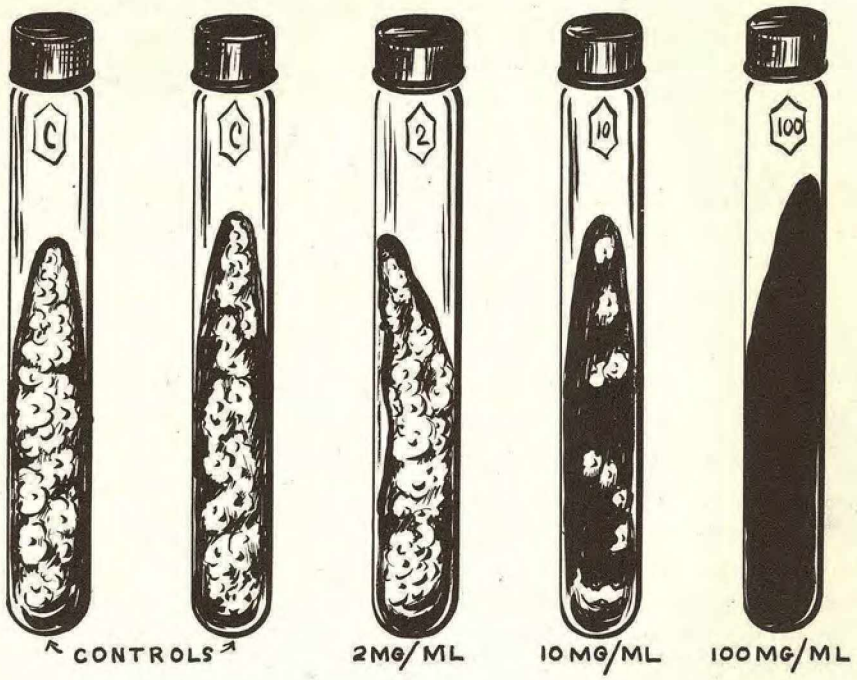
Streptomycin has had a relatively short but nonetheless dramatic history. Within a period of 5 years, extensive laboratory and clinical tests have firmly established the drug as the most promising agent available today for the treatment of tuberculosis. Since the discovery of the tubercle bacillus by Koch in 1882, a variety of chemical compounds of different types had been examined for therapeutic qualities but with discouraging results. Until the discovery of streptomycin there was, in fact, little hope that a successful therapeutic agent ever would be available.

Streptomycin was first described by Waksman and coworkers in January 1944. It was isolated from a soil micro-organism, *Streptomyces griseus*, from which it derives its name. Early experiments indicated that the substance would suppress the growth of a wide variety of bacteria in the test tube, among them the human tubercle bacillus. Subsequent studies at the Mayo Clinic, begun in early 1944, indicated a definite therapeutic effect of streptomycin on experimental tuberculous infections in guinea pigs. Results were so encouraging that large-scale production of the drug was begun almost immediately. The following year, Feldman and Hinshaw of the Mayo Clinic first reported on the possible value of streptomycin in the treatment of human tuberculosis, and extensive clinical trials since that time have fully substantiated these early impressions.

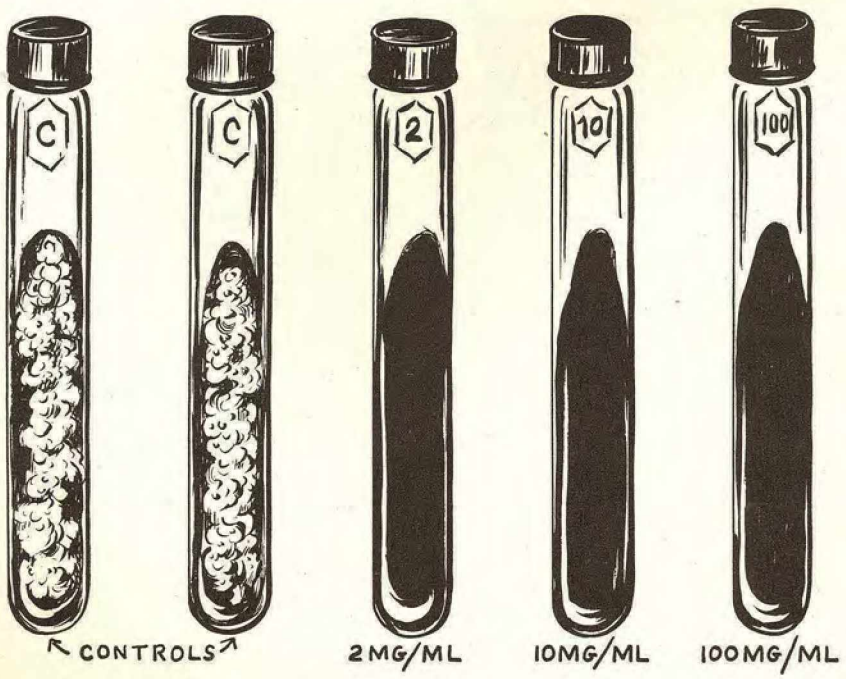
In certain types of the human disease, the drug has been found to exert a marked suppressive effect upon the course of the disease but none would consider it a cure. As clinical trials were extended, it was observed that certain toxic manifestations (for example, rash and deafness) appeared, as did definite resistance of the tubercle bacilli to the drug, a phenomenon which has recently served to reemphasize the need for close collaboration between bacteriologist and physician. Youmans and his coworkers found, for example, that organisms isolated from patients after prolonged treatment with streptomycin often exhibited an increase in resistance to the drug of from 500 to 1,000 fold as compared to tests performed prior to treatment. Subsequent studies in other laboratories have confirmed these findings. It is evident that nearly half of all tubercle bacilli have some resistance to streptomycin, varying from very little to complete.

The importance of performing streptomycin sensitivity tests, therefore, cannot be overemphasized, particularly since recent laboratory studies indicate that prolonged treatment of animals experimentally infected with a streptomycin-resistant bacillus actually decreases their survival time. Of even greater clinical importance is the occasional appearance of an organism whose growth is actually enhanced by streptomycin. Such an organism was recently isolated in the laboratories of the Tuberculosis Section. It is highly important, then, that streptomycin sensitivity tests be performed on tubercle bacilli isolated from patients prior to treatment and at frequent intervals during treatment. In the event that drug resistance is detected in these bacilli, specific alternate therapy may be initiated.

GROWTH OF STREPTOMYCIN-RESISTANT TUBERCLE BACILLI ON TEST MEDIA
(Growth on Media with 10 Milligrams Streptomycin per Milliliter)



RESULTS OF STREPTOMYCIN SENSITIVITY TEST WITH SUSCEPTIBLE ORGANISMS
(No Growth in Presence of Streptomycin)



Using currently available techniques, streptomycin sensitivity tests may be performed with either pathologic materials (such as sputum, urine, and pus) or pure cultures of the organism. The preferred medium for the sensitivity test is that recently recommended by the American Trudeau Society. It consists of a nutrient agar base containing glycerol and malachite green to which are added, just before tubing, a sterile, fresh, egg-yolk solution and streptomycin dilutions to give final concentrations of 2, 10, and 100 micrograms per milliliter of medium. The tubes of medium are allowed to harden in a slanted position and are then stored in the refrigerator until needed. The performance of sensitivity tests with pathologic materials necessitates preliminary chemical treatment of the specimen in order to eliminate contaminating micro-organisms, other than the tubercle bacillus, which might interfere with the test. Following decontamination and concentration (centrifugation at high speed), the resulting sediment is ready for inoculation. Pure cultures of the tubercle bacilli to be tested are prepared by grinding a clump of the bacilli in a test tube with a sterile wire loop and suspending them in a small quantity of sterile saline. Whether pure culture or other test substance be used, 0.1 milliliter of the prepared material is inoculated onto each of the culture tubes containing the graded amounts of streptomycin and on a control tube containing no drug.

After inoculation, the tubes are incubated at 37° C. and examined for growth of tubercle bacilli every week for a total of 4 weeks. Reports are made just as soon as grossly visible growth is adequate for evaluation of sensitivity. For purposes of reporting, the actual number of colonies on each culture slant is counted and recorded since any interpretation of results is based on the assumption that:

(a) each visible colony was derived from a single bacillus in the original suspension, and

(b) each tube of medium received a representative portion of the material.

Reports are based upon a comparison of the number of colonies on the streptomycin tubes with the number of colonies on the control tube. If growth appears only on the control tube, the bacilli are considered to be completely sensitive (nonresistant) to the drug concentrations tested. By the same token, if equal numbers of colonies appear on all of the streptomycin tubes and the control tube, the organisms are reported as completely resistant. Intermediate findings indicate partial resistance. For example, if the control tube has approximately 100 colonies and only 50 colonies appear on one of the streptomycin tubes (say the 2-unit tube), the organisms are considered to be partially resistant; that is, roughly 50 percent of the original bacillary population withstood the concentration of streptomycin in question.

Growth in test tubes of tubercle bacilli isolated from patients prior to treatment with streptomycin is completely inhibited by 0.5 to 1.0 micrograms of drug per milliliter of medium. By the end of the first month of therapy, resistance usually first becomes apparent and after 3 or 4 months, it is not unusual to encounter bacilli which will tolerate from 50 to over 1,000 micrograms. The clinical importance of this phenomenon has already been noted. The resultant need for the utmost cooperation between physician and bacteriologist cannot be ignored. Testing of tubercle bacilli for streptomycin sensitivity requires frequent recourse to techniques which only a well-staffed laboratory can furnish. The Tuberculosis Section, fully aware of this need, has incorporated in its training courses detailed instruction in the use of currently approved laboratory procedures.

FUNDAMENTALS OF DETERGENTS

PRODUCTION NO.
CDC 5-079.0
RELEASED 1949

FILM STRIP
35 mm. Sound
Black & White
Length: 72 Frames
Time: 9 Minutes

GRAPHIC FORM
- Photographs
- Drawings

PURPOSE

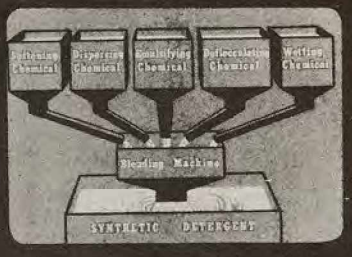
To aid in teaching sanitarians the fundamental principles of detergents.

AUDIENCE

Public health personnel (especially sanitarians) and other groups interested in sanitation procedures in food handling industries.

CONTENTS

1. Cleaning operations are based on four principles: solvent action of hot water, mechanical scrubbing to loosen dirt, chemical action of cleaning components called detergents, and rinsing to remove cleaning compounds and loose dirt particles.
2. Thorough cleaning is dependent on the use of specific cleaning compounds.
3. Soaps are **compounds** and therefore their compositions cannot be varied enough to meet all water conditions and cleaning requirements.
4. Synthetic detergents, on the other hand, are usually **mixtures** of basic chemicals and, therefore, in manufacture their compositions may be varied to fit any cleaning problem.
5. Chemicals for softening water, dispersing mineral formations, emulsifying grease, deflocculating clumps of soil particles, and decreasing surface tension all go into the manufacture of synthetic detergents.
6. The best results are obtained only when a detergent is fitted by composition and manufacture to accomplish the cleaning job for which it is used.
7. A good cleaning job results in a low bacteria count and therefore tends to safeguard the health of people using the articles cleaned.



AVAILABILITY

Thirty day loan upon request to ....

MEDICAL DIRECTOR IN CHARGE
COMMUNICABLE DISEASE CENTER
605 Volunteer Building, Atlanta 3, Georgia

Produced by

FEDERAL SECURITY AGENCY

COMMENTS

This filmstrip is built around 5 simple experiments that explain the cleaning action of a synthetic detergent.

ORAL HYGIENE
TOOTHBRUSH TECHNIQUE

PURPOSE To serve as a teaching aid in oral hygiene training.

AUDIENCE Public health personnel, dental students, dental hygienists, and others interested in oral hygiene training.

CONTENTS

1. A motivating introduction dramatizes the fact that 90 percent of children have at least one decayed tooth at the age of 6; that on the average, an additional tooth decays every 16 months between the ages of 6 and 14 years; and that 73 percent of people never visit the dentist except in an emergency.
2. A thorough oral prophylaxis, employing dental office instruments, should be given by the dentist or dental hygienist at least once every 6 months.
3. For home care of the teeth everyone should be equipped with flat dental tape, a properly designed tooth brush, and a rubber stimulator for gum massage.
4. Undesirable oral conditions can be avoided or reduced by regular and efficient home and clinical care of the teeth and surrounding tissue.
5. Tooth-brush technique is adequately portrayed showing various steps to be taken in order to obtain and maintain a clean, healthy mouth.
6. The teeth should be thoroughly brushed immediately after each meal and just before retiring.

AVAILABILITY

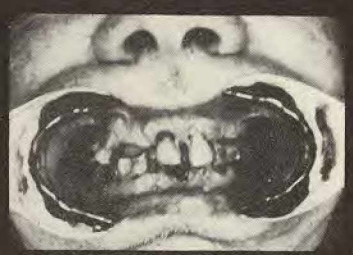
Thirty day loan upon request to . . . .
MEDICAL DIRECTOR IN CHARGE
COMMUNICABLE DISEASE CENTER
605 Volunteer Building, Atlanta 3, Georgia

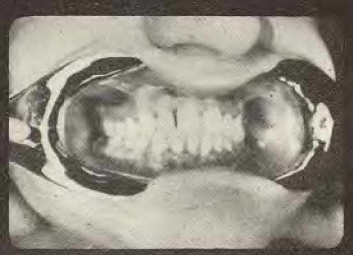
Produced by
FEDERAL SECURITY AGENCY

PRODUCTION NO.
CDC 5-135.0
RELEASED 1949

FILM STRIP
35 mm. Sound
Color
Length: 30 Frames
Time: 5 Minutes

GRAPHIC FORM
- Photographs
- Drawings





COMMENTS

This short filmstrip has been devoted to the subject of tooth-brush technique — with emphasis on proper home care.

REVIEW * * * PICTORIAL REVIEW * * * PICTORIAL REVIEW

FLY DENSITY SURVEYS by the GRILL METHOD

PRODUCTION NO.
CDC 4-086.0
RELEASED 1949

MOTION PICTURE
16 mm. Sound
Color
Length: 210 Feet
Time: 6 Minutes

GRAPHIC FORM
● Photography

PURPOSE

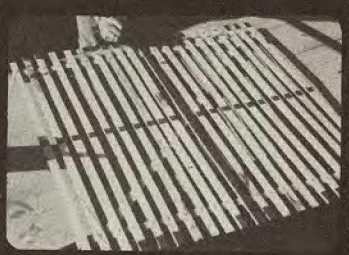
To serve as an aid in teaching the nature, construction, and use of the fly grill used in measuring fly density.

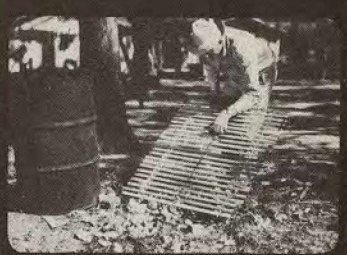
AUDIENCE

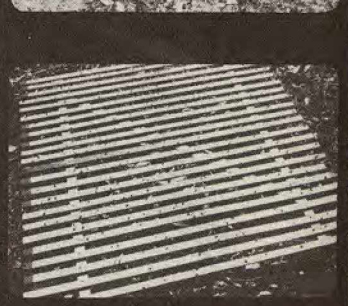
Public health personnel and others who may assist in fly control problems.

CONTENTS

1. Fly density in different places can be compared by counting the number of flies which alight on a simple framework of wooden slats called a fly grill.
2. The grill is constructed by evenly spacing 24 slats, each 36" x ¼" x ¾", on a light but rigid frame 1 yard square. The counting of large numbers of flies is facilitated by dividing the grill into quarters and by painting the ends of alternate groups of three slats.
3. In surveying the fly density of a block, the inspector carefully places the grill over the most potent fly attractants to be found there and writes on his record card the number of each kind of fly that alights on the grill. He also records other data such as type of attractant and moisture conditions.
4. In cases where the flies are so numerous as to make an accurate total count impossible, those on one quadrant are counted and the total number estimated by multiplying this count by four. The final record includes the five highest counts in the block.
5. At the end of the day, the densities of the flies in the various blocks are calculated and compared in order to obtain data to guide the application of control measures or to determine the effectiveness of such measures.







AVAILABILITY

Thirty day loan upon request to. . . .
MEDICAL DIRECTOR IN CHARGE
COMMUNICABLE DISEASE CENTER
605 Volunteer Building, Atlanta 3, Georgia

COMMENTS

FS No. 5-133 (35mm. Si. Col., 30 Frames), a filmstrip of the same name and content.

Produced by
FEDERAL SECURITY AGENCY

The COLLECTION of ADULT FLIES

PRODUCTION NO.
CDC 4-085
RELEASED 1949

MOTION PICTURE
16 mm. Sound
Color
Length: 220 Feet
Time: 6 Minutes

GRAPHIC FORM
- Photography
- Drawings

PURPOSE

To show the procedures used to catch flies with the sweep net, fly trap, and cone net; and that these methods are best suited, respectively, for rapid surveys, for detailed qualitative studies, and for collecting live flies over natural attractants.

AUDIENCE

Professional and subprofessional public health personnel and others involved in community fly control.

CONTENTS

1. The sweep net, the fly trap, and the cone net are three effective devices for the collection of adult flies.
2. Collections made with a sweep net are most helpful in learning quickly the kinds and numbers of flies which occur in an area. The net is swung back and forth through the concentration of flies. Those caught in the apex are transferred to a cage and sent to the laboratory along with data as to the type of location, attractant, time, and weather conditions.
3. The fly trap is well suited to making collections in qualitative fly surveys. The trap is placed over the attractant in a suitable location; and flies, after feeding, move up through the cone into the cage above. After a specified time the operator takes the trap with its catch of flies to the laboratory.
4. The fly cone net is a modified type of fly trap especially useful when live flies are needed for bacteriological or virological study. The cone is placed over flies as they feed on natural attractants. Then a cape is placed around the cone excluding all light except through the opening at the apex. The flies swarm toward the lighted opening and into a cage which is held over it.
5. In excessively hot or dry climates the flies may be kept cool on their trip to the laboratory by placing the cages on melting ice.

AVAILABILITY

Thirty day loan upon request to ....

MEDICAL DIRECTOR IN CHARGE
COMMUNICABLE DISEASE CENTER
605 Volunteer Building, Atlanta 3, Georgia

Produced by

FEDERAL SECURITY AGENCY

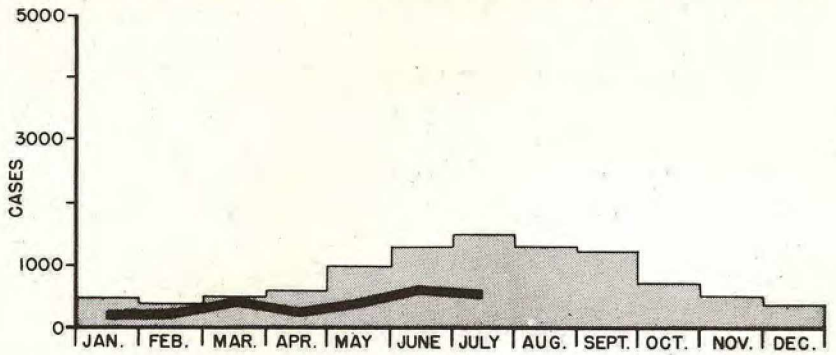
COMMENTS

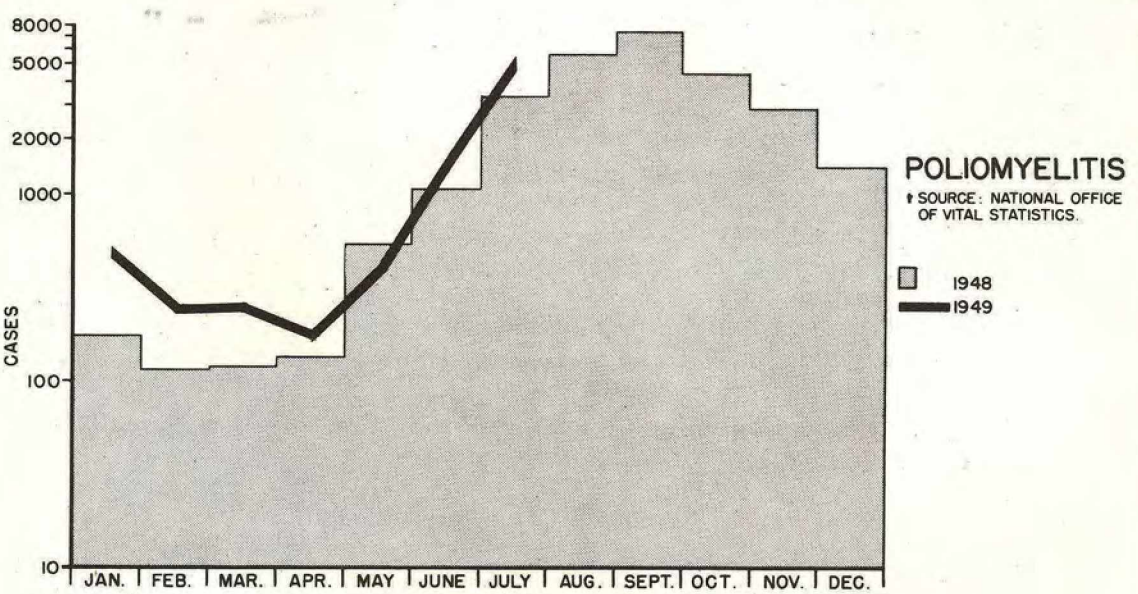
The same subject matter is presented in F-S No. 5-122.0 "The Collection of Adult Flies"

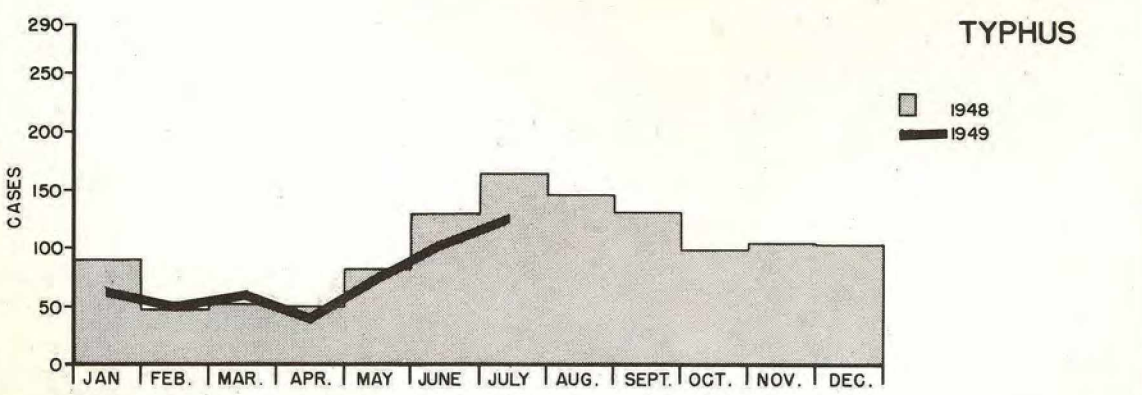
REVIEW * * * PICTORIAL REVIEW * * * PICTORIAL REVIEW

MORBIDITY TOTALS FOR THE UNITED STATES *
MALARIA, POLIOMYELITIS, TYPHUS

1948 - INCOMPLETE 1949 - AS REPORTED







FSA PHS CDC ATLANTA, GEORGIA

* DATA ARE TENTATIVE AND INCOMPLETE

DIVISION HIGHLIGHTS

Administrative

A concerted effort was made to put into use items of equipment stocked in the warehouse. A list of available equipment was contained in Administrative Letter No. 71, Supplement No. 5, issued July 29 on the subject: "Catalog of Supplies and Equipment Stocked in CDC Headquarters Warehouse." This has resulted in the moving of a considerable amount of this equipment into the operating areas.

Stock surplus to the needs of CDC has been declared and is in the process of being disposed of through transfer to other government agencies and by sale. Unserviceable items classified as salvage have been reported and inspected. This material is awaiting the inspector's report for final disposition. All repairable items have been repaired and returned to stock for reissue.

Effective May 1, 1949, Mr. Donald K. Dobyns was appointed Personnel Officer vice Mr. Spencer R. Gervin.

A native of Oklahoma, Mr. Dobyns was graduated from the University of Oklahoma and received his master's degree in Personnel Administration from Columbia University.

His first job with the government was with the Home Owners Loan Corporation in New York. From there he went to Omaha, Nebr., to be Personnel Officer for HOLC's regional office. Returning to New York, he became Personnel Officer for the Federal Public Housing Authority there. His next job --- and his last one prior to coming to CDC --- was Personnel Officer for the Mental Hygiene Division of the U. S. Public Health Service in Washington.

Competitive Civil Service registers have been established by the CDC Board of Examiners for film librarian, CAF-7; project supervisor, CAF-12; educationist, P-5; and biological aid, SP-1 through SP-8. The Fifth Region established a register for statistician, P-2 through P-6.

The following 28 manuscripts were edited and cleared for presentation and/or publication:

Andrews, Justin M.: The physician's role in national malaria eradication.

Brooke, M. M. and Goldman, Morris: Polyvinyl alcohol-fixative as a preservative and adhesive for protozoa in dysenteric stools and other liquid materials.

Brown, H. W. and Williams, R. W.: Filariasis control by DDT residual house spraying, Saint Croix, Virgin Islands --- Part II. Results.

Buck, Ross W.: The health department and the housing hygiene problem.

Crawford, James H.: Determination of the specific gravity of ragweed pollen *(Ambrosia elatior)* and conversion of gravity sample counts to volumetric incidence.

Dent, Jack E., Morlan, Harvey B., and Hill, Elmer L.: Effects of DDT dusting on domestic rats under colony and field conditions.

Eskey, C. R., Prince, Frank M., and Fuller, F. B.: Transmission of *Salmonella enteritidis* (Gaertner) by the rat fleas *Xenopsylla cheopis* (Roths.) and *Nosopsylla fasciatus* (Bosc.).

Goldman, Morris: The experimental infection of pupae of *Philosamia cynthia* Drury (Lepidoptera: Saturniidae) with *Trypanosoma cruzi* Chagas.

Goodwin, Melvin H., Jr.: Observations on dispersal of *Anopheles quadrimaculatus* (Say) from a breeding area.

King, Elizabeth O. and Frobisher, Martin: The *in vitro* test for virulence of *Corynebacterium diphtheriae.*

Maldonado, Jose' F., Acosta-Matienzo, Josefina,

and Thillet, Carlos J.: Biological studies on the miracidium of *Schistosoma mansoni*, Part II. Behavior of the unhatched miracidium in undiluted stools under diverse environmental conditions.

Mandel, Emanuel E. and Popper, Hans.: Experimental papillary necrosis of the kidney.

Miller, Seward E.: Some newer concepts in the laboratory diagnosis of tuberculosis.

Quarterman, K. D., Baker, W. C., and Jensen, J. A.: The importance of sanitation in municipal fly control.

Rowe, John A.: Disease studies to begin in April.

Ruhe, Joseph S. and Crazier, Philip D.: A review of histoplasmosis as affecting the veterinarian.

Sciple, George W.: A recent record of Bachman's warbler from the Gulf Coast of Mississippi.

Spangler, C. E.: Sources of water.

Steele, James H.: International rabies control.

Steele, James H. and Tierkel, Ernest S.: Rabies: problems and control.

Steele, James H.: Rabies control.

Stephens, Porter A.: Some recent reports on the ground application of insecticides with power equipment for the control of mosquitoes.

Stoenner, H. G., Mencimer, F. R., and Fraser, R. S.: An outbreak of ovine listeriosis in Utah.

Sussman, Oscar and Caldwell, H. W.: Q fever --- Arizona.

Sussman, Oscar and Prchal, C. J.: *Taenia saginata* --- in man and cattle in Arizona.

Upholt, W. M. and Fay, R. W.: Insecticide investigations.

Zukel, John W.: Observations on ovarian development and fat accumulation in *Anopheles quadrimaculatus* and *Anopheles punctipennis*.

Zukel, John W.: A winter study of *Anopheles* mosquitoes in southwestern Georgia with notes on some culicine species.

Editing, vari-typing, and lay-out were completed on the following publications, which were forwarded to the Service Branch for reproduction: Rat-Borne Disease Prevention and Control, and Communicable Disease Center Activities, 1947-1948.

The second Medical Library Association duplicate exchange was completed. Material was sent to 81 separate librarians. It consisted of 685 unbound and 10 bound journals and 5 books. Over two hundred volumes were bound and an additional two hundred volumes were sent to the bindery. More than six hundred volumes were added to the library during the quarter.

New Books in the Library

Advances in biological and medical physics. Vol. 1, 1948

Advances in pediatrics. Vol. 3, 1948

Advances in protein chemistry. Vol. 4, 1948

American journal of medicine. Vol. 6, 1949

American public health assoc. Public health - a career with a future, 1948

Anderson, William Arnold Douglas. Pathology, 1948

Barrows, Harold Kilbrith. Floods, their hydrology and control, 1948

Benmeyr, Berl. Sanitation for food handlers and sellers, 1948

Biochemical preparations. Vol. 1, 1949

Bote, George S. Roddy the rat, 1949

Conference of the U. S. Public Health Service with the State and territorial health officers. 43d, 44th, 45th, Proceedings, 1945, 1946, 1947

Conn, Howard Franklin. Current therapy, 1949

Cox, Leonard. Human Torulosis, 1946

Daley, Raymond. Progress in clinical medicine, 1948

Davis, Harry Aaron. Shock and allied forms of failure of the circulation, 1949

Dawes, Ben. Trematoda of British fishes, 1947

DeOng, Elmer Ralph. Chemistry and use of insecticides, 1948

Directory of medical specialists. Vol. 4, 1949

Dyke, Sidney Campbell. Recent advances in clinical pathology, 1947

Ende, Marinus van den. Chemotherapeutic and other studies of typhus, 1946

Follis, Richard Holden. Pathology of nutritional diseases, 1948

Gaskill, Arthur L. Pictorial continuity; how to shoot a movie, 1947

Goodman, Louis Sanford. Selected references on audio-visual methods, 1948

Grulee, Clifford Groselle. Child in health and disease, 1948

Hadfield, Geoffrey. Recent advances in pathology, 1948

Hepler, Opal Elsie. Manual of clinical and laboratory methods, 1949
Hoare, Alfred. Short Italian dictionary, 1947
Hunt, Herschel. Physical chemistry, 1947
Illinois University division of animal nutrition. Methods of vitamin determination. 1948
International Congresses on tropical medicine and malaria. Proceedings, Vol. 1, Vol. 2, 1948
Kabat, Elvin Abraham. Experimental immunochemistry, 1948
Lederle Laboratories, New York. Recent trends in antibiotic therapy, 1949
Lewis, George Morris. Introduction to medical mycology, 1948
Lichtman, Solomon Sydney. Diseases of the liver, gallbladder and bile ducts, 1949
Lloyd, Blodwen. Science in film, 1948
McCord, Carey Pratt. Odors, physiology and control, 1949
Means, James Howard. Thyroid and its diseases, 1948
Minot, George H. Symposium of hematology, 1949
Moholy-Nagy, Ladislaus. Vision in motion, 1947
National Research Council. Food and Nutrition Board. Survey of food and nutrition research in the U. S., 1948
Peterson, Alvah. Larvae of insects, Part 1, 1948
Price, Esther Louise Gaskins. Fighting spotted fever in the Rockies, 1948
Ross, Herbert Holdsworth. Textbook of entomology, 1948
Sahyun, Melville. Outline of amino acids and proteins, 1948
Sahyun, Melville. Proteins and amino acids in nutrition, 1948
Selye, Hans. Textbook of endocrinology, 1947
Simonds, Herbert Rumsey. Handbook of plastics, 1949
Simmons, James Stevens. Public health in the world today, 1949
Smith, Geddes. Human relationships in public health, 1949
Study Abroad, 1948
Sturgis, Cyrus Cressey. Hematology, 1948
Sutton, Richard Lightburn. Handbook of diseases of the skin, 1949
Tauber, Henry. The chemistry and technology of enzymes, 1949
Thoma, Kurt Hermann. Oral surgery, Vol. 1, Vol. 2, 1948
Tobias, Norman. Essentials of dermatology, 1948
Tressler, Donald Kiteley. Freezing preservation of foods, 1947
Thienes, Clinton Hobart. Clinical toxicology, 1948
Tylman, Stanley Daniel. Theory and practice of crown and bridge prosthesis, 1947
U. S. Congress. House. To amend the Public Health Service act..., 1947
U. S. Library of Congress. Subject cataloging division. Subject headings used in the dictionary catalog of the Library of Congress, 1948
Walter, Carl Waldemar. Aseptic treatment of wounds, 1948
Warkentin, John. Physician's handbook, 1948
Whelpton, Pascal Kidder. Forecasts of population of the U. S., 1945-75, 1947
Williams, Roger John, Introduction to biochemistry, 1948
Work, Thomas Spence. Basis of chemotherapy, 1948
Wredden, Joseph Hugh. The microscope; its theory and applications, 1948
Wright, Irving Sherwood. Vascular diseases in medical practice, 1948

Engineering

Malaria Control. Time-motion studies to evaluate various operational techniques of residual spray crews and to determine the efficiency of the spray equipment in use in the various States were conducted in Arkansas, Tennessee, and Alabama during the quarter. A demonstration truck was fitted with equipment which included a Dobbins power sprayer, a Bendix-Westinghouse compressor unit, an exhaust aerosol generator, a constant-pressure emulsion tank, two hose reels (each provided with 100 feet of hose), and three types of spray cans. Considerable interest was created in the States where the compressor unit was shown.

An experimental spraying project using 50 percent water-wettable methoxychlor for the con-

trol of flies was initiated in Tennessee during the quarter. Approximately 1,200 premises will be treated with this chemical, 600 in Lauderdale County and 600 in Tipton County. Check areas for comparative studies will include the entire residual DDT spray area of the State, plus a number of untreated premises which are normally included in the routine inspectional program. It is expected that 10 percent of the premises treated with methoxychlor will be inspected at monthly intervals until the end of the fly breeding season. The only deviation from the inspectional procedure recommended by the Entomology Division will be the recording of the highest 1-square-yard count at barns on the premises inspected.

Samples of a pamphlet entitled "Spray Time is Here" were distributed to the States at the beginning of the spraying season and several hundred thousand have been ordered by the States for distribution to householders in areas where residual spraying is under way. A memorandum (Residual Spray Memorandum No. 21-49) was issued to the field in April outlining operational procedures for malaria residual spraying during the 1949 season.

Residual spray operations were under way during the quarter in all 13 States participating in the CDC malaria control program. Table 1 summarizes spray operations during the quarter and includes a cumulative total of spray applications by States for the 1949 fiscal year.

Typhus and Rodent Control. This quarter closed a period of relatively high allocations for cooperative dusting projects. The typhus problem has been so reduced in Arkansas, Mississippi, North Carolina, South Carolina, and Tennessee, that only one or two counties have had

Table 1

SUMMARY OF DDT RESIDUAL SPRAY OPERATIONS
April 1 — June 30, 1949

State	No. Cos.	No. House Spray Applic.	Lb. DDT	Operation Man-Hours			Lb. DDT per Applic.	M.H. per Applic.	M.H. Per Lb. DDT	Total Spray Applic. 7/1/48-6/30/49
				CDC	Local	Total				
Alabama	31	76,894	98,382***	65,196	28,843	94,039	1.73	1.22	0.70	122,070
Arkansas*	48	90,281	112,557	16,602	104,870	121,472	1.25	1.35	1.08	113,272
Florida	24	36,774	53,808	8,890	40,977	49,867	1.46	1.36	0.93	49,462
Georgia	35	80,973†	63,477	13,820	48,600	62,420	0.71	0.70	0.98	140,554††
Kentucky	11	8,392	23,486	1,616	21,696	23,312	2.80	2.78	0.99	12,726
Louisiana	18	49,767	60,617	7,440	52,019	59,459	1.22	1.19	0.98	50,973
Mississippi*	22	110,644	181,893	46,264	84,950	131,214	1.64	1.19	0.72	133,686
Missouri*	15**	35,983	46,350	8,568	41,289	49,857	1.29	1.39	1.08	43,766
North Carolina	30	43,518	42,905	3,631	35,268	38,899	0.99	0.89	0.91	87,141
Oklahoma*	14	16,144	21,706	2,160	20,551	22,711	1.34	1.41	1.05	26,351
South Carolina	46	110,771	122,286	12,312	110,568	122,880	1.10	1.11	1.00	176,945
Tennessee	13	22,519	37,327	22,213	72	22,285	1.66	0.99	0.60	25,340
Texas	28	34,351	27,815	27,308	25,303	52,611	0.81	1.53	1.89	71,870
Subtotal Continental U. S.	335	717,011	892,609	236,020	615,006	851,026	1.28	1.17	0.92	1,054,156
Puerto Rico	-	1,251	736	864	928	1,792	0.59	1.43	2.43	4,156
Grand Total	335	718,262	893,345	236,884	615,934	852,818	1.28	1.17	0.92	1,058,312

*Through June 26, 1949; all others through July 2, 1949
**Including Fort Leavenworth and Jefferson Barracks (Platte and St. Louis Counties)
***Including 30,891 pounds resin-based DDT spray
†Excluding 2,564 applications of resin spray and related data
††Excluding 6,239 applications of resin spray

an average of 10 cases of typhus during the five calendar years 1943-1948. Louisiana has only four counties with such an average (down three from the preceding preapproved list). Some of these have had no reported typhus during the last two seasons.

Even in those States with a more widespread problem—Alabama, Florida, Georgia, and Texas — the number of counties preapproved for operations is only 96 as compared with 117 during the previous calendar year.

Therefore, emphasis in the counties formerly on the preapproved list for long-range cooperative dusting is being devoted to promotion of antirat sanitation and rat stoppage or ratproofing. Spot-dusting to prevent other cases is done on premises in these counties where a case or two of typhus has occurred. Antirat work follows immediately.

A ratproofing program is advocated, to some degree, in all communities.

The average number of man-hours for initial ratproofing and maintenance in city-operated programs during fiscal year 1949 was 60 and the lowest was 45.

Some cities have recently withdrawn from the operation of ratproofing programs and now permit private industry to do all the work. Where private industry has demonstrated that it can and will do as efficient and effective a job of ratproofing, including the estimate of work needed, the health department may use its employees, previously assigned to this work, in general antirat sanitation programs and maintenance inspection. This may be the answer for health departments with limited personnel assigned to this type of work or those that have seen the program expand to such an extent that it is impracticable to secure additional personnel.

Residual DDT dusting activities were under way in 100 counties in 10 States during the quarter and a maximum of 39 ratproofing projects were reported. Table 2 indicates these activities during the quarter.

Fly Control. A preliminary mimeographed edition of "The Control of Domestic Flies" for administrative use was released in June. Publication of the final version of the manual is to be made at a later date, when time permits the incorporation of photographic material and added comments from the field.

In cooperation with the National Foundation for Infantile Paralysis detailed plans were devised for the project handling of fly specimens and sewage samples for virological examination.

In addition to funds for the five-city fly control program now under way, funds were made available in fiscal year 1950 allocations for the operation of demonstration projects in other areas. Budgets were therefore prepared for approximately four projects.

The environmental sanitary surveys in the projects at Troy, N.Y.; Muskegon, Mich.; Charleston, W. Va.; and Topeka, Kans., were completed during the quarter. On all projects vehicular and spraying equipment was made ready for control operations and personnel were employed and trained in spraying techniques.

Table 2

SUMMARY OF TYPHUS AND RODENT CONTROL ACTIVITIES
March 20 — July 2, 1949

Type	States	Counties	Premises Treated	Amount Per Premises	Man-Hours Per Premises
Residual DDT Dusting	10	100	150,705	3.3 lb.	0.40
Poisoning:					
Food Bait	9	54	71,066	0.6 lb.	0.34
Liquid 1080*	8	-	16,613	1.1 pts.	0.78
Ratproofing	12	39†	1,307	-	39.90

* Alabama uses arsenic water, not 1080.
† Projects reporting.

Cooperation was obtained from local authorities and the press in a general clean-up of fly breeding areas within the project cities. Actual control operations were begun on the Phoenix, Ariz., project in April and regular spraying activities were begun on the four northern projects in June. A bulldozer was delivered to the Charleston, W. Va., project, where operation of a sanitary land fill will be undertaken as a fly control measure.

Special Services. Assistance was rendered the flooded areas in Texas during the quarter by consultant service provided by the Region 8 CDC representative and by the procurement of chemicals for insect control in the affected area.

Inquiries were received in several instances regarding the advisability of airplane spraying for the control of flies during polio outbreaks. The Center advised that the Public Health Service does not recommend such airplane dispersion since fly control can best be accomplished by good general sanitation.

A preliminary draft of model mosquito abatement district legislation was completed during the quarter and copies forwarded to the regional offices for comment. Copies also were forwarded to legal representatives of the Public Health Service in Washington for review and comments as to the legal aspects.

Entomology

Residual house-spray operations of the Malaria Eradication Program were well under way in most States by the end of the quarter. Inspection reports covering 1 to 7 months' periods have been received from the following States: Alabama, Arkansas, Florida, Kentucky, Louisiana, Mississippi, Oklahoma, South Carolina, Tennessee, and Texas. A new "Register of Complaint" form (PHS 100.16) is now being used by the States in reporting reasons for excessive fly abundance, with the object of both simplifying the reporting of field data as well as making certain that all pertinent factors are considered by each investigator. A review of the first lot of these forms (11 forms from 1 State) shows that in seven cases DDT was effectively killing flies but that conditions for fly breeding were so favorable that good control was not being obtained; in four situations, DDT appeared to be at fault, with three of these possibly due to poor application, and one to a heavy coating of dust which completely covered the DDT-treated surface, rendering it relatively ineffective.

A 4-year comparative summary of the entomological evaluation of the Malaria Eradication Program in 13 Southeastern States, covering the years 1945-48 inclusive, has been prepared. This was based on 56,200 entomological inspections of sprayed and unsprayed houses, and shows that 98.6 percent of the sprayed houses were maintained "*quad* free"; whereas in the unsprayed houses, only 81.7 percent were found by inspection to be "*quad* free." Chart 1 shows these summaries, plus a break-down of the sprayed areas by months after spraying, the latter covering the first five successive post-spray months.

CDC participation in the investigational DDT residual-spray operations on St. Croix in the Virgin Islands was discontinued late in April. Dr. H. W. Brown of the Columbia University School of Public Health, who reviewed the project just prior to that time, reported that the Hetrozan treatment among school children evidently had reduced filariasis infections to such an extent that further attempts to evaluate the effect of DDT residual spraying on the disease incidence would be useless.

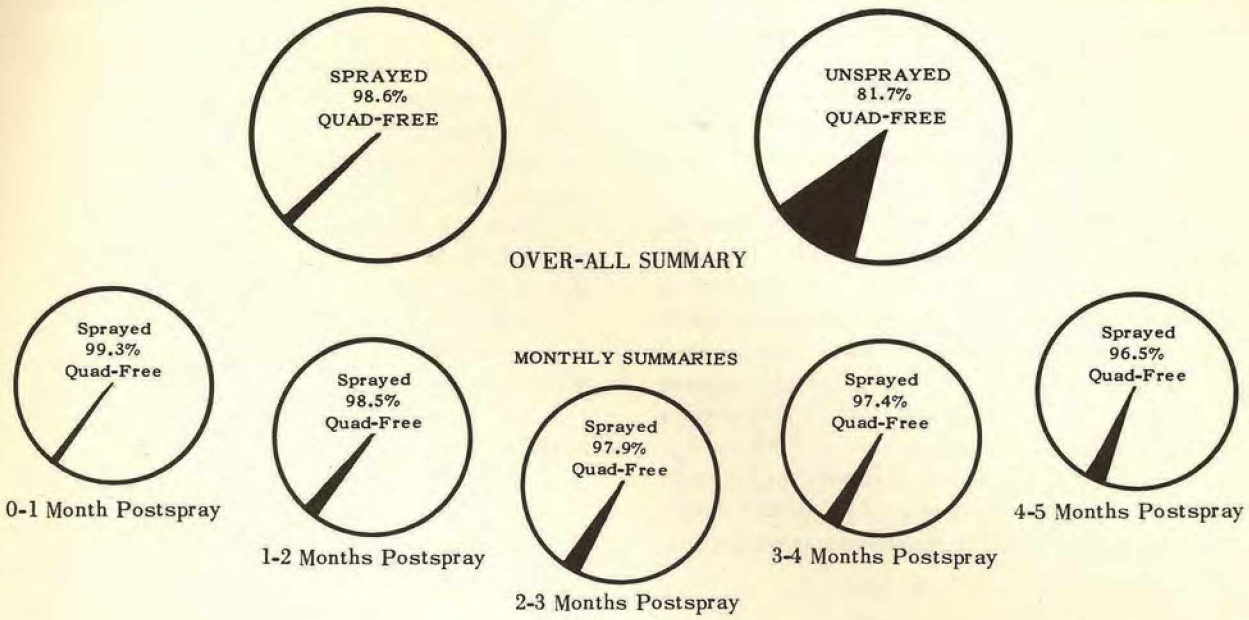
MALARIA INVESTIGATIONS

Newton, Ga. At the end of March 1949, the abundance of adult *A. quadrimaculatus* in the collecting stations near Mossy Pond --- the most productive locality in the region under observation --- was more than three times the number observed during any March in the previous 5 years. Thus, it appears that the remarkably large winter population of adult *A. quadrimaculatus* which was present during the exceptionally warm winter of 1948-49, resulted in an unusually large spring population. However, the early summer population was no larger than that of some

Chart 1

COMMUNICABLE DISEASE CENTER MALARIA ERADICATION PROGRAM

Summary of entomological evaluation of Malaria Eradication Program in Southeastern States, 1945-1948 inclusive. Based on comparison of 56,200 entomological inspections of sprayed and unsprayed houses. Percentage of houses maintained free of *Anopheles quadrimaculatus* is shown in each case.



previous years.

Collections of mosquitoes for precipitin tests during the quarter to determine blood feeding habits have included 614 females of *A. quadrimaculatus*, 1,176 females of *A. crucians*, and 8 females of *A. punctipennis*. Sixty-one percent of the *A. quadrimaculatus* contained unassimilated blood, while the corresponding figure for *A. crucians* complex was 63 percent. Six of the eight *A. punctipennis* contained blood. Houses in all the experimental area (parts of Baker and Early Counties) were included in the DDT residual spray program this calendar year.

Salivary glands of 222 adult females of *A. crucians* were dissected and examined for sporozoites during June 1949. The stomachs of over two hundred of these specimens also were dissected and examined for the presence of cysts. The glands of seven of the dissected specimens were found to contain bodies morphologically similar to the sporozoites of human malaria. Further studies to determine the source of these infections are under way.

Manning, S.C. To more adequately study mosquito density and habits, the number of *Anopheles* collecting stations was increased to include various types of resting places other than barns. Specimens for precipitin tests are now collected from all the different types of shelters in the area in which *Anopheles* may be found. All resting places, at 17 premises, are being inspected regularly.

Mosquitoes for dissection purposes are obtained from barns only, because of ease of collection, and because it is believed there is complete mixing of the mosquito population after feeding. Thus, the place where mosquitoes are collected has no necessary relation to the place where the infection was acquired.

The population of *A. quadrimaculatus* this year is smaller by about 90 percent than at the same time last year. The population of *A. crucians* is smaller only by about a third. The water levels, which have been high, should have increased breeding; however, the slow and small fluctuation of levels, a comparative dry spell

in March and April, and lower minimum temperatures in the same period may have been the factors causing the low densities.

All houses in the area were sprayed with 2½ percent DDT during the quarter. A prespraying inspection revealed only one mosquito (*crucians*) in a newly erected, unsprayed house.

During the quarter, 7,761 *A. crucians*, 1,460 *A. quadrimaculatus*, and 94 *A. punctipennis* were dissected. Seven *A. crucians* and one *A. quadrimaculatus* were sporozoite-positive. In all but one case, sporozoites were stained and measured.

Arrangements were made with Dr. Martin D. Young of the National Institutes of Health Laboratory in Columbia, S. C., for human injection of *crucians* sporozoites. In three cases the same male Negro paretic was injected.

During the quarter, treatment of all persons having histories of previous malaria parasitemia was attempted. This work was carried on because of the occasional finding of malaria-positive smears during human blood surveys and the persistence of sporozoite infections in the mosquito populations. This activity was under the direct supervision of Dr. G. E. McDaniel of the South Carolina State Board of Health, and the drug used was 4 amino-quinoline (SN-8137-5), supplied by Dr. G. Robert Coatney of the National Institutes of Health. Table 1 gives pertinent data summarizing the experience in carrying out this program.

Arrangements have been made with the Fish and Wildlife Service to supply the field station with copies of climatological and water-level readings collected at their station at Scott's Lake. This Scott's Lake station is situated only 8 miles west of the test area and is considered to be representative of conditions in the experimental area.

Helena, Ark. A total of 3,634 blood films collected during school surveys were negative for malaria.

A malaria-positive blood film was diagnosed at the station in April from a patient sent to the laboratory for examination by a local private physician. The patient was visiting in West Helena when she had an attack of malaria. Pre-

Table 1

SUMMARY OF TREATMENT OF PREVIOUSLY POSITIVE MALARIA CASES IN THE SOUTH CAROLINA EXPERIMENTAL AREA

	INTENSIVE AREA	PERCENT	MARGINAL AREA	PERCENT	TOTAL AREA	PERCENT
Observed taking complete treatment (3 doses)	527	89.9	85	76.6	612	87.8
Observed taking two doses*	28	4.8	13	11.7	41	5.9
Observed taking one dose*	11	1.9	2	1.8	13	1.9
Refused treatment	15	2.6	7	6.3	22	3.1
Not contacted	5	0.8	4	3.6	9	1.3
Total persons positive	586	100.0	111	100.0	697	100.0
Population of experimental area	1,957	-	1,151	-	3,108	-
Percent of population with previous positives	29.9	-	9.6	-	22.5	-

		%
Previous positives resident in intensive area	586	69.8
Previous positives resident in marginal area	111	13.3
Previous positives moved, deceased, etc.	142	16.9
Total of previous positives	839	100.0

*Drug to complete treatment was left for some of these, and treatment probably was completed, although persons were not observed taking drug.

sumably, the infection was acquired in Panama, C. Z., where she had her first attack 9 months previously.

Anopheles counts to date in the intensive observation area (Lake Township) were lower during the quarter than those made in the same stations last fall. Reconnaissance inspections of possible *Anopheles* breeding places indicated only scattered, light breeding.

ENCEPHALITIS INVESTIGATIONS (In cooperation with Hooper Foundation, California)

Transmission Studies. Because of the availability of mosquitoes in the vicinity of the field laboratory, it was decided to conduct the following experiments in Bakersfield:

(1) Transmission of the St. Louis virus by *Aedes dorsalis*. This species of mosquito has been found infected in nature with the St. Louis virus, but transmission attempts have not been made as yet.

(2) Transmission of the Western equine virus by *Culex stigmatosoma*. Earlier attempts did not yield conclusive results.

(3) Transmission of mixed St. Louis and Western equine viruses by *Culex tarsalis*. This is a continuation of earlier studies started in San Francisco.

(4) A study of the effect of an immune blood meal on virus present in *C. tarsalis* infected with Western equine virus.

Mites. Further information is being sought relative to the bionomics of *Liponyssus sylviarum* and *Dermanyssus americanus* in Kern County. Nests of the commoner species of local birds are being searched; and where sufficient mites are present, a sample is collected and frozen for virus studies. In the case of *L. sylviarum*, the first mite-infested nest of this year was that of an English sparrow, collected on April 28. To date, 26,690 mites have been frozen for virus studies.

Further attempts are being made to transmit the viruses of St. Louis and Western equine encephalitis by means of *L. sylviarum*. Following the failure to maintain successfully a laboratory colony in Berkeley for this purpose, as previously reported, it was decided to attempt the transmission under simulated natural conditions. A colony of hybridized sacred white doves and Chinese ringneck doves has been utilized for this purpose. These doves breed readily in captivity, each pair of adults producing two young every 30 days. It has been noted in the past that "spontaneous" infestations of *L. sylviarum* have occurred on the nestlings. The transmission experiment was set up in the outdoor insectary.

All young doves produced between June 13 and the end of July have been or will be inoculated either with Western equine or St. Louis virus. Half-starved mites collected from nests of wild birds are introduced into the dove nests and, after an appropriate period, samples of these are collected and tested for presence of virus. Later in the year, all doves other than those inoculated will be tested for the presence of antibodies.

FLY-BORNE DISEASES

Fly evaluation procedures were begun on all five of the study projects during the quarter. In Troy, Muskegon, and Charleston adult fly activity was minimal, although a considerable amount of fly breeding was occurring. At Topeka, fly densities also were relatively low; while at Phoenix, the fly season was in full swing.

In Phoenix, inspection and residual spray operations began the latter part of March, with space-spray activity beginning in early April. Fly densities were fairly low during the early part of April, but during the 3d and 4th weeks a tremendous rise occurred. Control measures at this time were relatively ineffective, principally because of the inexperience of personnel and because of the tremendous fly breeding potential which was prevalent in that area. The city-wide block average reached its maximum during the week of May 13-21, with a grill count of 18.5 flies. At this time, the average for the untreated city was 88.6 flies. The magnitude of fly breeding in the low-class sections of town (approximately 410 blocks) was so great that the available control power was unable to cope with the situation. Because of that, and the fact that other sections of Phoenix also were showing high fly densities, primary attention was given to the business section and middle and high class residential areas. Principal efforts were directed at the business area

where complete operational coverage was maintained. With this degree of coverage, it is worthy of note that during the period from May 6 to 21, when the block average in a comparable section in the untreated town rose from 30.9 to 96.3 flies, it dropped from 13.7 to 11.7 flies in Phoenix. As at all the fly control projects, an intensified effort is being made to institute better storage, collection, and disposal of garbage, as well as more effective general sanitation by the individual householder.

ECTOPARASITE-BORNE DISEASES

During this quarter, tabulation and analysis were made of the ectoparasite data on rodent examinations and of the results of complement fixation tests on rat sera, as follows:

(1) from 10 percent DDT dusted counties for the preceding quarter, January-March 1949;

(2) from 5 percent DDT dusted counties for the preceding quarter, January-March 1949; and

(3) from Florida (10 percent DDT dusted) for the period April-December 1948.

Data available for analysis on the effectiveness of 10 percent DDT dust were received from 38 counties in 10 States. The quantity of data summarized consists of records of ectoparasite identifications from 1,078 rats, and of successful tests of sera from 977 rats.

Results of complement fixation tests on rat sera show a lower percentage of typhus infection in rats, both from dusted and from nondusted premises, than for any previous quarter. Three hundred seventy-four rats (see table 2) from nondusted premises averaged 10.3 percent positive, 93 rats caught 1 to 6 months after dusting averaged 2.2 percent positive, and those caught more than 6 months after dusting averaged 10.1 percent positive. These figures indicate a 79 percent reduction in the 1-6 month group, but no reduction in the group dusted more than 6 months previously.

The highest incidence of infection was found in those rats caught 1 to 30 days after dusting. Since typhus antibodies do not appear in rat blood until the 12th to 18th day after exposure and remain for several months, all rats taken less than 12 days after dusting should be classed as nondusted, while those taken 12 days to 1 month (or even several months) after dusting may have acquired the infection before dusting. The above figures show a continued decrease in the over-all percent of typhus infection in rats and a very substantial reduction due to 10 percent DDT dusting operations.

Ectoparasite data on the 1,078 rats examined show excellent control of *Xenopsylla cheopis* and of *Laelaps nuttalli* during all dusting periods; excellent or very good control of *Leptopsylla segnis*, *Echidnophaga gallinacea*, and *Echinolaelaps echidninus* during the first 6 months but no control after that time; and little or no control of *Liponyssus bacoti* or *Polyplax spinulosa* at any time. The number of *Nosopsyllus fasciatus* was too small to be of any significance. For all three species of nonstick-tight fleas, these data show excellent control

Table 2

NUMBER OF RAT SERA TESTED AND PERCENT OF RATS POSITIVE FOR TYPHUS
All States, January — March 1949, 10 Percent DDT Dust

Month (1949)	Number of Rats Tested					Percent Rats Positive for Typhus			
	Non-dusted	Days After Dusting			Total	Non-dusted	Days After Dusting		
		1-30	31-180	181+			1-30	31-180	181+
						%	%	%	%
January	95	8	49	164	316	6.0	0.0	2.0	16.0
February	159	17	20	150	346	8.0	59.0	5.0	8.0
March	120	25	24	146	315	16.0	20.0	0.0	5.0
Total or Average	374	50	93	460	977	10.3	30.0	2.2	10.1

Table 3

NUMBER OF RATS TESTED AND PERCENTAGE POSITIVE FOR TYPHUS
5% DDT Dust

State or Month	Number of Rats Tested				Percent Rats Positive for Typhus			
	Non-dusted	Days After Dusting 1-30	31-180	181+	Non-dusted	Days After Dusting 1-30	31-180	181+
					%	%	%	%
Alabama	54	16	439	288	48.0	6.0	2.0	2.0
Georgia	417	66	304	200	11.0	8.0	5.0	2.5
Louisiana	245	80	37	10	16.0	11.0	35.0	30.0
N. Carolina	0	0	0	35	-	-	-	0.0
January	235	19	427	209	26.0	26.0	3.0	3.0
February	209	65	268	159	15.0	11.0	4.0	3.0
March	272	78	85	165	7.0	4.0	13.0	1.0
Total for Quarter	716	162	780	533	15.4	9.3	4.2	9.0

during the first 6 months and satisfactory control after 6 months.

Data available for analysis on effectiveness of 5 percent DDT dust were received from 37 counties in four States and consist of records of ectoparasite identifications from 2,387 rats, and of successful tests of sera from 2,191 rats (see table 3).

Results were obtained by complement fixation tests of rat sera in nondusted areas of 5 percent DDT dust projects. When analyzed by States, it is found that Alabama and Georgia obtained good reduction in the percentage of typhus-positive rats in dusted premises, but that in Louisiana the percent positive was higher in dusted premises than nondusted premises. There were no positives among the 35 rats from North Carolina.

Ectoparasite data on the 2,397 rats examined from 5 percent DDT dusting projects from January through March have been analyzed by States. The results from Georgia and Alabama are consistent and show good control of *X. cheopis*, whereas the results from Louisiana are quite variable and show poor control of this flea. The number of rats examined in North Carolina is too small to be significant.

Results indicate that 5 percent DDT dust gave consistently poorer results than 10 percent dust during this quarter. The ratio of 73 percent reduction by 5 percent dust in *X. cheopis* infestation during the first 6 months after dusting is compared with a 91 percent reduction obtained by 10 percent dust.

Data on the effectiveness of DDT dusting operations in Florida for the period April through December 1948 were not received in Atlanta until April 1949 due to the lack of personnel to make ectoparasite identifications in Florida during that period. Results of complement fixation tests on rat sera show a very substantial reduction in the percentage of rats positive for typhus in each dusting period of each quarter. The reduction for all dusting periods for all three quarters is 77 percent and that for the 31-180-day period is 81 percent. This is a considerably greater reduction than that obtained by other States during this same period.

The percentage of typhus-positive rats in nondusted areas, 15.0 percent, is about the same as the average for all States during this period. However, the percentage of positive rats from dusted areas, 3.5 percent, is extremely low and should be a factor tending to materially reduce the amount of human typhus infection in those areas.

DYSENTERY VECTOR CONTROL

Curtailment of funds has necessitated some rearrangement in operational plans but all funda-

mental considerations were retained, including the intensive study of the effect of improved sanitation on fly densities in Thomasville. Mapping of all towns to be studied has been completed, and epidemiological and entomological census work is proceeding. By July 1, a total of 2,200 rectal swab cultures from children under 10 years of age had been processed in the laboratory, in addition to a large number of cultures from domestic animals, wild rodents, and flies. All families in the studies area are being visited monthly by Epidemiological Aids in order to collect current data on populations, transiency incidence of diarrhea, and other diseases.

Epidemiology

MALARIA INVESTIGATIONS

Generally, trends in reported malaria continued downward throughout the United States. Only Texas is reporting a substantial number of cases to the Public Health Service. Several State health departments are still receiving numerous reports, which, upon negative epidemiological indication, are not forwarded to the Public Health Methods. The results of epidemiological appraisal of cases are presented in table 1.

In South Carolina, a new morbidity reporting system is being effectuated.

Considerable interest has been aroused by the recent discovery of 13 positive slides (11 *Plasmodium vivax* and 2 *Plasmodium falciparum*) from 200 slides examined by the South Carolina State Health Department from a preimpoundment school survey carried out in March 1949 by the McCormick County Health Department on the Clark-Hill Reservoir. Although these cases have not been fully checked epidemiologically, such a high rate of parasitemia in school children suggests relatively recent transmission. Further epidemiological surveys are planned. The Georgia State Health Department also plans to conduct preimpoundment surveys on the Georgia side of the Savannah River where the Clark-Hill Reservoir may alter mosquito breeding conditions.

In Mississippi, the problem of spurious reporting of malaria has been solved. Only 15 cases have been reported to the State in the first half of the calendar year. Only one of these was believed by Dr. Mires, the appraiser, to represent new transmission.

The malaria appraisal program of the Communicable Disease Center is vitally influencing the economic development of the South. In Mississippi, as well as several other States, industry has previously shied away from locating new plants in areas from which stem extensive spurious reports of malaria. How much these false reports have cost the State in income may never be ascertained; but in Mississippi, the figure was estimated to be in the millions of dollars by the State health officer in his recent discussions with the Governor and with State economic councils. The appraisal of reported malaria has convinced the Mississippi State Health Department that it has never had as much malaria as reported.

Dr. Mires has also investigated other reported communicable diseases. Data collected on typhus cases indicate complement fixation serological tests were not being done until he collected bloods or made known the Center's needs to see all cases of typhus confirmed by complement fixation test. Dr. Mires also participated in the planning of a mouse survey in Mississippi for rickettsialpox. He assisted the Adams County Health Department in mass vaccination of more than 11,000 citizens against smallpox. Three cases had resulted when an oil-field worker introduced the disease from Louisiana. An epidemic of food poisoning in north Mississippi was attributed to infected coconut cream pie made in Memphis. One death resulted and three cases were nearly fatal among the 130 cases investigated.

TYPHUS INVESTIGATIONS

It has been 23 months since the last cycle of DDT dusting was completed in Thomas County and 21 months since the last cycle was completed in Brooks County, Ga.

There has been a similar infestation of rats from these two counties and untreated Grady County with the louse, *Polyplax spinulosa* (see table 2).

Table 1

RECORD OF MALARIA APPRAISAL

4th Quarter—Fiscal Year 1949

April, May, June, 1949

State	Cases Reported to State	Cases Appraised	Positive	Presumptive	Cases Appraised As	
					Doubtful	Improbable
Alabama†	32	23	3	13	5	2
Arkansas*	106	No reports available	-	-	-	-
Florida	10	-	-	-	-	-
Georgia*	15	28	12	-	3	13
Kentucky	1	-	-	-	-	-
Louisiana	3	-	-	-	-	-
Mississippi*	9	12	1	2	3	6
Missouri	1	-	-	-	-	-
North Carolina	2	-	-	-	-	-
Oklahoma	29	-	-	-	-	-
South Carolina*	350	54	9	17	15	13
Tennessee	3	-	-	-	-	-
Texas	853	-	-	-	-	-
13 State Total	1,414	117	25	32	26	34

† Late reports: 3 in February and 4 in March (1 doubtful, 2 positive, 4 presumptive), not included in 3d quarter report.

* States with malaria appraisal programs.

Source: Weekly and monthly reports from State health departments. Preliminary figures.

Table 2

ECTOPARASITE INFESTATION

June 1949

	Grady Co.*	Thomas Co.**	Brooks Co.†
No. of rats examined	236	242	235
Xenopsylla cheopis:			
Percentage of rats infested	60.2	13.2	11.5
Average number per rat	4.8	1.0	0.7
Leptopsylla segnis:			
Percentage of rats infested	21.6	4.5	1.7
Average number per rat	0.5	0.1	0.0
Bdellonyssus (Liponyssus) bacoti:			
Percentage of rats infested	44.9	27.7	10.2
Average number per rat	9.5	5.9	0.9
Polyplax spinulosa:			
Percentage of rats infested	76.7	73.1	68.9
Average number per rat	6.9	6.4	4.3

* Untreated check county.

** Last cycle, dusting with 10 percent DDT, completed July 30, 1947.

† Last cycle, dusting with 10 percent DDT, completed September 30, 1947.

The mite, *Bdellonyssus bacoti*, increased in abundance during the quarter more rapidly in the dusted counties than in the untreated area, but continued to be less prevalent on rats from dusted areas than on those from untreated Grady County.

There has been a seasonal decline in infestation of rats with the mouse flea, *Leptopsylla segnis*, in all three counties during May and June. The peak of infestation occurred in untreated Grady County in April when nearly 70 percent of all rats were infested. This is in contrast to an infestation during the same month of nearly 25 percent in dusted Thomas County and about 7 percent in dusted Brooks County.

Over 10 percent of all rats examined from Thomas County were infested with *Xenopsylla cheopis* during the quarter, and over 10 percent of the Brooks County rats were infested during the last 2 months of this period. In the untreated county, infestation with this flea jumped from about 30 percent in April to over 60 percent during May and June.

A continued increase in the percentage of Grady County rats that were positive to the complement fixation test for murine typhus was observed during the quarter. A corresponding increase in positive rats was lacking in the areas previously dusted.

Thus far in 1949 there have been 12 cases of human typhus recorded for the untreated county while only 1 case has been recorded from each of the dusted counties.

The percentage of *Rattus rattus* in the total collection of rats examined serologically is shown as follows:

Period	Grady Co.	Thomas Co.	Brooks Co.
May 1946-April 1947	75	81	100
May 1947-April 1948	69	74	98
May 1948-April 1949	59	66	95

R. norvegicus has supplanted *R. rattus* in many sections of the northern part of the study area and is moving gradually southward. The continued spread of the more aggressive Norway rat may eventually have an influence on human incidence of typhus.

Laboratory

SURVEYS AND CONSULTATIONS

Program reviews of State public health laboratories were completed during this quarter for Alabama, Delaware, Maine, Maryland, Minnesota, Nevada, New Jersey, Rhode Island, and the District of Columbia.

City public health laboratory surveys were made in Milwaukee, Wis., and Richmond, Va.

Specimens and cultures received for diagnostic study totaled 23,659 items, sent from 45 States and the following 10 territories or countries: Alaska, Hawaii, Puerto Rico, Australia, Canada, Chile, Cuba, Denmark, Guatemala, and Norway.

A poliomyelitis outbreak was investigated in Oklahoma. Encephalitis in Georgia was the subject of another investigation.

TRAINING

Dr. Miller participated in a "Refresher Course for Local Health Officers" at the University of Utah and Dr. Brooke conducted a course, "The Laboratory Diagnosis of Intestinal Parasites," at Tucson and Phoenix, Ariz.

The fourth directors' course in the "Laboratory Diagnosis of Parasitic Diseases" began on June 20, 1949, with 24 students representing 14 States and 4 foreign countries.

The first 2-week course for directors in the "Laboratory Diagnosis of Bacterial Diseases" was given May 23 to June 3, 1949. Sixteen students from 12 States and 1 foreign country registered for this course.

The first course in "Enteric Bacteriology," April 25 to May 20, 1949, consisted of seven students, from four States and Canada. During this course, Dr. Fritz Kauffman, of Copenhagen, Denmark, participated in lectures and seminars. He remained on duty as a special consultant during May.

The second course for directors in the "Laboratory Diagnosis of Tuberculosis" was held June 13-17, 1949, with a total of 25 students

representing 17 States and 2 foreign countries.

The first 1-week course for directors in the "Laboratory Diagnosis of Mycotic Diseases" began on June 6, 1949, with 26 students enrolling from 16 States, Puerto Rico, and 2 foreign countries.

EXTENSION SERVICE

The regular shipments of specimens, keys, and charts sent each month to three hundred laboratories included slides of *Borrelia recurrentis* and *Plasmodium falciparum*; adults and larvae of *Musca domestica*; gross specimens or slides containing *Iodameba butschlii*, *Endamoeba coli* cysts, *E. histolytica* trophozoites, and *Endolimax nana* cysts.

In answer to requests for special study and teaching materials, seven loan sets of parasitological specimens and keys of entomological material were sent to laboratories in six States.

PARASITOLOGICAL STUDIES

Balamuth's medium for maintaining stock cultures of intestinal protozoa was evaluated and found to be less satisfactory than the Boeck and Drbohlav's medium now in routine use.

The many grades of polyvinyl alcohol available were compared for use in PVA-fixative procedures. The "90-25" grade already in use was found to be as satisfactory as any other in present techniques.

Animal inoculation with human strains of *E. histolytica* was attempted in order to establish chronic amebiasis for the study of diagnostic methods. The human strains used spontaneously disappeared from infected dogs.

During this quarter, 2,582 specimens from 22 States were submitted for diagnostic study. Of these, 362 were submitted for detection of intestinal parasites.

No malaria parasites were found in 8,307 malaria survey blood smears from Arkansas, Georgia, Mississippi, and South Carolina.

Antigens were made for use in the complement fixation tests for amebiasis, trichinosis, and echinococcosis. These antigens were supplied for routine use in the Bacteriology Branch, where more than 800 were tested for evidence of infection with these parasites.

VIRUS AND RICKETTSIA STUDIES

On June 1, Dr. Morris Schaeffer assumed duties as Officer in Charge of the Branch at Montgomery, Ala. Dr. Schaeffer was formerly Associate Professor of Pediatrics, Western Reserve University, and Director, Communicable Disease Hospital, city of Cleveland, Ohio.

High titers of neutralizing substance for Newcastle disease virus (NDV) can be demonstrated in many fresh normal sera. After such sera are heated at 56° C. for 30 minutes, the neutralizing effect disappears. Serum from animals known to be immune to NDV shows no such response to heating, and an appreciable titer of antibody persists.

A study of the comparative pathology of Newcastle disease has been started.

Sera from wild animals were tested for neutralizing antibodies against Western equine encephalomyelitis virus (W.E.E.) and Eastern equine encephalomyelitis virus (E.E.E.). The results are shown in table 1.

Table 1

Neutralization tests with wildlife sera against E.E.E. and W.E.E. viruses

Source	Animal	E.E.E		W.E.E.	
		No. Specimens	No. Positive	No. Specimens	No. Positive
Georgia	Birds	22	5	14	3
	Skunks	48	2	50	0
	Other Mammals	112	0	102	0
Louisiana	Birds	1	0	22	0
Mississippi	Birds	84	1	63	0

Myositis virus has been detected in feces or throat washings from four humans in Alabama, and in throat washings from two humans in Tennessee. Work was begun to detect strain characteristics in these isolates and to compare them with known stock viruses.

No virus was recovered from 26 lots of lice

and mites collected on Ship Island. Lymphocytic choriomeningitis virus (L.C.M.) was detected in mice into which one additional lot of ectoparasites had been injected.

Complement fixation tests demonstrated L.C.M. antibodies in 5 of 23 sera from humans. One of these was from Colorado, two from Georgia, one from Louisiana, and one from Missouri. Complement-fixing antibodies were present in one of three sera from Colorado tested against St. Louis encephalitis antigen.

Herpes virus was recovered from one human brain received from Tennessee.

BACTERIOLOGICAL STUDIES

General Bacteriology and Serology. Development of the *in vitro* virulence test for *Corynebacterium diphtheriae* was continued, with special emphasis placed on factors responsible for falsely negative results given by *minimus* type strains.

Studies on antibacterial resistance to *C. diphtheriae* were continued, as were those on complement fixation in relation to antidiphtherial immunity.

Evaluation of the tube agglutination test for brucellosis is nearing completion; no significant differences in results have been found among three strains of *Brucella abortus* tested for antigenicity. Slide agglutination tests will be evaluated in the near future.

Evaluation of complement fixation tests for rickettsial disease is also nearing completion. It has been found that the Kolmer icebox fixation and the Bengston water bath fixation show approximately the same sensitivity and specificity. Some sera give better results with the one test, while other sera give better results with the other. Neither test seems clearly superior to the other. Davis' modification of the Bengston procedure was found to be too sensitive and was lacking in specificity.

The *Streptococcus* laboratory received cultures from two outbreaks of streptococcal disease. From Pennsylvania 19 cultures had been isolated during a scarlet fever epidemic. Cultures from cases of acute nephritis in Maryland totaled 129.

The *Leptospira* laboratory found that sera from three humans agglutinated *Leptospira icterohaemorrhagiae*. The three specimens came from Louisiana, Georgia, and Ohio.

The complement fixation test for rickettsial disease was performed on 275 human sera from 24 States. A single specimen from Arizona and one from New Jersey were positive against Q fever antigen. Positive tests were obtained in 8.4 percent of those tested with Rocky Mountain spotted fever antigen; 12.3 percent reacted with rickettsialpox antigen. Murine typhus antibodies were present in 11.2 percent of the sera, whereas the Weil-Felix test on the same sera gave 15.2 percent positive reactions. It must be noted again that Weil-Felix results and complement fixation test results cannot be correlated satisfactorily.

None of 209 bovine sera from Alaska showed antibodies for Q fever.

Most of the specimens submitted for heterophile antibody determinations came from private physicians. Of the 25 sera received, 14 were positive, but only 2 were positive when absorption was included in the procedure.

Sera submitted for tests with Lygranum antigen totaled 48, with 3 positives from Arizona, 2 from Georgia, and 1 from Maryland.

The complement fixation test for amebiasis was requested 701 times, with most of the specimens coming from physicians. Of these sera, 172 were positive (24.5 percent). Sera submitted for trichinosis showed 17 percent of 88 positive; sera for echinococcosis contained 14.3 percent of 34 positive. Of all the 823 sera submitted for parasite-antibody determination, 17 percent were unsatisfactory for use.

Brucella antibodies were present in 1 of 369 animal sera from Alaska, in 1 of 5 human sera from North Carolina, in 6 of 13 human sera and 139 of 192 animal sera from Wisconsin.

Enteric Bacteriology. Study of the interrelationships of *Shigella alkalescens*, *Shigella dispar*, certain paracolon strains, and selected "O" groups of *Escherichia coli* was initiated. Antisera were prepared for some *E. coli* "O" groups said to be concerned in enteric infections.

Work has been continued on propagation and standardization of bacteriophages. Bacteriophages for the typing of *Salmonella typhosa*, with directions for their use, were distributed

to selected laboratories, looking toward cooperative establishment of regional centers for 'phage typing.

A total of 431 cultures was received for identification. Cultures from food yielded 4 *Salmonellas* and 1 *Alcaligenes*. Of 349 cultures from humans, 94 were *Shigella*; 134, *Salmonella*; and 103, paracolons. Among 77 cultures from animals were 41 *Salmonellas* and 30 paracolons.

Bacteriophage typing was done on 37 *S. typhosa* cultures and 2 *S. paratyphi B* cultures.

Tuberculosis. Studies were begun to evaluate a cytochemical test for virulence of tubercle bacilli, to determine efficient sterilizing methods for dentures of tuberculosis patients, and to evaluate a serological test for the laboratory diagnosis of tuberculosis.

Routine specimens for diagnosis totaled 808 sputa, gastric fluids, and other body fluids. These specimens came from the Veterans Administration and from the Georgia State Department of Health. Pathogenic materials were submitted also from the District of Columbia, Florida, Nebraska, North Carolina, Ohio, and Tennessee.

From Alaska, Arizona, Georgia, Louisiana, Ohio, Oregon, and Texas came 14 cultures for typing. Alabama, Florida, Georgia, New York, Washington, and Virginia submitted 566 cultures for streptomycin sensitivity testing.

Mycology. A *Blastomyces* vaccine has been completed and is ready for use. Several lots of histoplasmin and of coccidioidin have been prepared for standardization before use.

Tests for the comparative usefulness of five media for the isolation of Dermatophytes have begun, using pathological material from the mycology clinics at a local hospital.

From 307 cultures submitted for diagnosis, 60 pathogenic fungi were identified. *Candida albicans* was found in 24 specimens and *Microsporum Audouini* in 25 cases. *Cryptococcus* was found once, *Coccidioides* twice, *Sporotrichum* once, *Actinomyces* once, *Trichophyton* three times, and *Malassezia* twice.

CLINICAL PATHOLOGY BRANCH

Laboratories for the Branch were placed in operation in April with a small staff of workers.

Comparative studies were made to evaluate the efficiency of standard clinical laboratory procedures, of newly described procedures, and some procedures developed in this Branch. Patient material has been developed in local hospitals to permit immediate correlation of laboratory tests with clinical conditions. Thus far these tests have been concerned with blood levels of creatinine, glucose, and protein.

Production

STORY DEVELOPMENT

Mr. L. C. MacMurray of the Training Division was permanently stationed at the Production Division as a full-time consultant on sanitary engineering, environmental sanitation, and related subjects. He will analyze subjects requested in this field for the purpose of establishing production priorities, determining subject coverage, and assisting in determining film content.

PRODUCTION

A color master was finished with the Sept camera on the production, "Oral Hygiene." Also, trials were done in 4 x 5-inch color transparencies on the production, "Portal Cirrhoses." A black and white trial was done on the production, "Fundamentals of Detergents."

Another production, "Laboratory Diagnosis of T. B. --- Part II," was started in May on the theater set and is now ready for a trial in 2 x 2-inch color film. A survey was made on "Field Training for Public Health Workers," and shooting was scheduled to begin the first of July.

During the quarter the Editing Department completed and had approved answer prints and release prints on "The Use of Aircraft for Insect Control."

The first of the series of films on "Tuberculosis" (preparation of a culture medium) was edited and approved in interlock form, and the negatives were matched, final recording was made, and an answer print was expected soon. Also, work was done on the direction of the second of the "Tuberculosis" series (preparation of pathological material).

Final recordings produced on filmstrips during the quarter included "How to Measure Deterioration in Dwellings," "Syphilis Horizon Chart," and "The Liver --- Part II, Part III, and Part IV." Final recordings were made for the motion picture, "Laboratory Diagnosis of T. B. --- Part I."

UTILIZATION

Distribution for the Film Library during the quarter is shown by the following table:

Month	CDC Motion Pictures	Motion Pictures Other than CDC	CDC Filmstrips	Total
April	259	58	308	625
May	159	40	207	406
June	77	26	62	165
Totals	495	124	577	1,196

Copies of the CDC Film Catalog and Utilization Guide were distributed to 105 different agencies during the quarter, and all descriptive pages for new films produced during the same period were mailed to all catalog holders to keep their catalogs up to date.

Approximately 100 requests for lists of CDC productions were received and filled.

Instructor guide for the film, "Foot and Mouth Disease," was prepared for reproduction.

An exhibit for the meeting of the American Medical Association in Atlantic City, June 6, entitled "Simple Blood Tests Available to General Practitioners," was completed. A second exhibit was sent to the meeting of the Medical Association of Georgia in Savannah, May 10-13. Another exhibit, entitled "A Quick Test for Creatinine, Glucose, and Protein Alteration in Blood Tests," was prepared for display at the Marine Hospital in Washington, D. C., May 12. A fourth exhibit, "Modern Treatment of Leprosy," which is now in production, has been planned for the meeting of the American Academy of Dermatology and Syphilology, in Chicago, Ill., December 4-8.

Visitors to the Utilization Branch during the quarter represented the countries of Lebanon, Iran, Ceylon, Chile, Brazil, Egypt, India, Sweden, the Philippines, China, Peru, and New Zealand.

PRODUCTION PROGRAM FOR THE VENEREAL DISEASE DIVISION, U.S.P.H.S.

Filmstrip 5-086.0, "Horizons of Syphilis," was completed for release in July 1949.

COOPERATIVE PROJECT WITH THE ARMY ON RAT CONTROL FILMS

The series of motion pictures on rodent control, being done cooperatively with the Army Photographic Services, is progressing according to schedule. Five of the 11 scripts were completed during the quarter. Sketches were made for the basic sets which the Army will construct.

MAJOR PRODUCTIONS RELEASED

Motion Pictures

4-069.1 Malaria Control on Impounded Waters (five chapters)
4-082.1 Topical Fluorides, Revised Edition
4-085.0 Collection of Adult Flies
4-086.0 Fly Density Survey by the Grill Method

Filmstrips

5-087.0 The Diagnosis of Primary Syphilis (Produced for Venereal Disease Division, U.S.P.H.S.)
5-092.0 Aquatic Plants Associated with *Anopheles* Mosquito Breeding Areas
5-106.1 The Liver, Part I -- Composite (not for distribution at present)
5-106.2 The Liver, Part I, Chapter I, The Hepatic Parenchyma and the Biliary Passages (not for distribution at present)

5-106.3 The Liver, Part I, Chapter II, The Vascularization of the Liver (not for distribution at present)
5-106.4 The Liver, Part I, Chapter III, The Architecture of the Liver (not for distribution at present)

MAJOR PRODUCTIONS COMPLETED, AWAITING RELEASE PRINTS

Motion Pictures

4-077.0 Use of Aircraft for Insect Control — Part I, Mosquito Control
4-089.1 The Laboratory Diagnosis of Tuberculosis -- Part I, Preparation of a Culture Medium

Filmstrips

5-113.0 Use of Aircraft for Insect Control -- Part I, Mosquito Control
5-122.0 Collection of Adult Flies
5-123.1 The Laboratory Diagnosis of Tuberculosis -- Part I, Preparation of a Culture Medium
5-133.0 Fly Density Survey by the Grill Method
5-135.0 Oral Hygiene
5-086.0 Syphilis Horizons
5-079.0 Fundamentals of Detergents
5-023.0 The Liver -- Portal Cirrhosis

OTHER PRODUCTIONS RELEASED

Film Guides

G 4-049.0 Epidemiology of Murine Typhus
G 4-052.0 Sanitary Land Fills
G 4-083.0 and G 5-119.0 Constructing a Sanitary Pit Privy

Exhibits

6-007.0 A Quick Test for Creatinine, Glucose, and Protein Alterations in Blood Tests, for Display at Marine Hospital.
6-008.0 Simple Blood Tests Available to General Practitioners, for Display at American Medical Association Meeting in Atlantic City, N. J.

Technical Development*

PHARR, TEX., BRANCH

Environmental Sanitation Studies. Environmental sanitation studies have been initiated at Pharr, Mission, and Edinburg, Tex., to demonstrate fly control by improved sanitation.

Fly populations were measured at the three city dumps, where different methods of garbage disposal are practiced. Mission, which uses a sanitary land fill, maintained satisfactory control. No insecticides were used at this dump. A fair degree of control was obtained at the Edinburg dump, where a modified sanitary land fill method was supplemented by the use of insecticides. The Pharr dump, with wastes piled or scattered indiscriminately, had dense fly populations.

An initial premises survey of sanitation and related factors that affect fly populations in Pharr, Mission, and Edinburg was completed. The survey showed an extremely wide difference in basic sanitation facilities in use and in the personal habits of the people in Anglo and Latin areas in the towns studied. Fly populations of the two areas showed a similar striking difference.

Chemical Fly Control Investigations. Outdoor residual fly sprays with and without an added adhesive agent were tested. The principal fly resting places in Elsa were treated with a 5 percent DDT emulsion containing 2 percent adhesive agent and 0.4 percent emulsifier. La Villa was treated in a similar manner and with like materials, except that the emulsion contained no adhesive agent. Considerable rain fell during the week following treatment. Fly population indices collected semiweekly showed that little or no control was obtained by either of these treatments. Both towns were retreated. An emulsion containing 2-3-0.8 percent chlordan-DDT-emulsifier was used in Elsa, and a mixture containing 2-3-2 percent chlordan-DDT-adhesive was used in La Villa. In Elsa, the fly population index dropped from a pretreatment 36 to a posttreatment 8, with a gradual rise to as high as 25 in the following 3½ weeks. In La Villa, the index dropped from a pretreatment 44 to a posttreatment 1.4, with a rise to 15.2 in the following 2½ weeks.

One half of 1 percent emulsions of chlordan, compound 118, compound 497, and toxaphene; 0.5 percent suspensions of compounds 118 and

* Abstracted from Technical Development Division Summary of Activities No. 18, April, May, June, 1949.

497; and dusts of 5 percent chlordan and 5 percent gamma isomer benzene hexachloride (BHC) were tested at 200 milligrams per square foot* to determine toxicity to house fly larvae breeding in various vegetable wastes. All chemicals used produced very good kill (90 percent or better), with the exception of toxaphene, which has given erratic results in tests to date. Compounds 118 and 497 gave almost complete larval control. In addition, they killed large numbers of adult flies that alighted on the still attractive treated media.

CONTROL METHODS AND EVALUATIONS

Field Investigations on Adult Fly Control. Based on 24-hour mortality of adult female laboratory-reared house flies exposed for 30 minutes to the treated surfaces in wall cages, the residual effectiveness of 16 insecticidal formulations applied on outdoor surfaces of painted and unpainted wood, brick, metal, and vegetation were tested. Best results during the first 2 months after treatment were obtained with compound 497, with and without rosin, when applied at dosage rates of 100 and 200 milligrams per square foot, respectively. Several formulations of DDT gave satisfactory results on most surfaces tested.

At dairies, in Chatham County, Ga., where laboratory tests had indicated DDT-resistant strains of house flies were present, applications to the milking barns and outbuildings of DDT emulsions with and without rosin, methoxychlor emulsion, and methoxychlor water-wettable powder, brought the flies under control at only 12 of the 21 dairies sprayed. Control was effective for only 1 week at 11 dairies and for 2 weeks at 1 dairy. This contrasts with effective control for over 3 months with one application of DDT at some of these dairies in 1945 and 1946.

Ectoparasite Investigations. A lethal box trap, equipped with a mechanism for firing a small shotgun shell loaded with Cyanogas A-Dust, has proved effective for collecting ectoparasites from trapped small mammals. In laboratory tests, white rats and their ectoparasites were killed in less than 1½ minutes after the traps were sprung. This improved lethal trap makes it possible to determine accurately the ectoparasites present on small animals at the time of trapping.

In April 1949, investigational work was undertaken to determine the effectiveness of some of the newer insecticides in the control of the chicken mite, *Dermanyssus gallinae*. The project was deemed advisable in view of the potential importance of this mite in the transmission of equine encephalitis. In limited field tests, emulsions of both DDT and BHC (95 percent gamma isomer) were effective in eradicating chicken mites from infested coops, when they were applied to the walls and ceilings of the chicken houses at approximately the usual rate, and at a somewhat heavier dosage to the floors of the coops, with the roosts being sprayed to saturation. Under similar test conditions, emulsions of toxaphene, chlordan, and compounds 118 and 497 were relatively ineffective.

INSECTICIDE STUDIES

Investigational Work on Adult Flies. Five chemical compounds have been tested for insecticidal activity as residual deposits by exposure of adult house flies, *Musca domestica*, to deposits of each chemical for periods up to 1 and 2 hours. Of those tested, one, amyl (2,4-dichloro phenoxy) acetate, showed 100 percent 24-hour mortalities with 15-minute exposure periods.

Laboratory evaluations of compound 497 showed that over a 17-week test period the deposits of 100, 200, and 300 milligrams of compound 497 per square foot were equal in effectiveness to 200 milligrams of DDT per square foot, whereas 15-minute exposures to deposits of 50 milligrams of compound 497 per square foot showed a loss of effectiveness at 11 weeks after spray application.

Combined deposits of 80 milligrams of methoxychlor and 200 milligrams of DDT per square foot were superior to other combinations or to 200 milligrams per square foot of either insecticide alone. Methoxychlor deposits on plywood show a lower initial effectiveness than is encountered at later tests.

Laboratory tests on plywood surfaces over a

*The usual rate of application for insecticides is 200 milligrams per square foot. Thus the rate will not be given hereafter except when it varies from this amount.

13-week period showed the residual effectiveness, against *M. domestica* females, of deposits from a 50-percent-methoxychlor water-wettable powder to be much better than deposits from technical-methoxychlor emulsions. Addition of 2 percent rosin to the emulsions decreased the residual effectiveness of the deposits but had no appreciable effect on the deposits of water-wettable powders. Deposits from formulations containing methoxychlor as a 90 percent concentrate in oil after low initial toxicity reached their maximum effectiveness 4 to 7 weeks after spray application. Various methods of removing the oil from the technical methoxychlor before formulation did not overcome the low initial residual effectiveness of deposits. Variations in the amount of methoxychlor in the xylene concentrates did not improve initial residual effectiveness. In a series using various solvents, deposits from formulations with Velsicol AR-60 showed the best initial effectiveness.

Deposits of DDT from 5 percent DDT xylene emulsions containing 2 percent of either Triton X-100 or X-155 as the emulsifier, and with or without 2 percent rosin as the adhesive, were exposed on glass panels to outside weathering. After a 10-week period with daily temperatures ranging from 70° to 95° F. and with a total rainfall of 7 inches, deposits with the 2 percent rosin added were giving 100 percent mortalities in 24 hours after 30-minute exposures of female *M. domestica, Callitroga macellaria,* and *Phaenicia pallescens.* Deposits from formulations without rosin were almost ineffective. No difference was detected between formulations with Triton X-100 or X-155. With methoxychlor deposits, the incorporation of 2 percent rosin simultaneously with the use of 4 percent Triton X-155 as the emulsifier markedly decreased the residual effectiveness as compared to deposits from methoxychlor formulations having no rosin and 2 percent of either Triton X-100 or X-155. Use of 2 percent rosin as an adhesive in 5 percent DDT-fuel oil formulations did not improve the residual effectiveness of deposits exposed to outside weathering. Deposits of DDT from a DDT-xylene-rosin homogenized emulsion after 8 months of outside weathering continued to give 100 percent mortality of adult house flies and blow flies.

All house fly strains from supposedly DDT-free premises near Savannah, Ga., and in Rio Bravo, Mexico, showed DDT resistance, but detailed field checks revealed DDT treatments within flight range of the collection sites. Comparisons of insectary strains from the USDA laboratory at Orlando, Fla., and this laboratory showed no marked differences in DDT susceptibility. Insectary records on pupal size and rate of adult emergence indicate increased vigor in insectary strains. A strain of white-eyed house flies was developed by means of X-ray radiation in an effort to produce a differently marked strain of house flies for possible use in population dissemination studies. Tests were made which determined no significant initial difference in DDT resistance between this mutant strain and normal house flies.

M. domestica pupae were placed in colony cages with 5, 15, and 45 percent, respectively, of the interiors lined with DDT, and the surviving adults supplied eggs for the succeeding generation. With 45 percent DDT coverage, 99 percent of the initial generation succumbed; but adults of the F_1-F_6 generations (68 percent mortality) showed a uniform increased resistance. With 15 and 5 percent DDT coverage, the mortality of the initial generation was not so high -- 93 and 83 percent, respectively -- but mortality of generations F_1 to F_6 showed progressive decrease. With 45 percent methoxychlor coverage, the mortality rate of the initial generation was low, equal to 45 percent DDT coverage in generations F_1 and F_2, but showed a decrease in the F_3-F_6 generations. Results from the 45 percent coverage with the combined insecticides (100 milligrams of DDT -- 100 milligrams of methoxychlor) were closely parallel to results with DDT alone. The knock-down rate of adults from each generation of each colony was determined under conditions of complete coverage by a knock-down recording machine. Differences between the various generations were less marked in the males than in the females. Even with fresh DDT deposits, knock-down rates decreased rapidly in successive generations -- the most marked decrease being in the colony with 45 percent DDT coverage.

Tests to determine the fumigant action of chlordan indicated that the amount volatilizing

from a deposit of 200 milligrams of chlordan per square foot in periods of 30 to 60 minutes decreased rapidly within 2 days after spray application. Deposits of 100 milligrams of chlordan per square foot required 60 minutes to produce vapor concentrations high enough for 70 percent mortality of adult female house flies exposed for 30-minute periods. Compound 118 showed a higher fumigant effectiveness than chlordan, while compound 497 showed less fumigant action under similar test conditions.

Investigational Work on Adult Mosquitoes. Deposits of 50 and 100 milligrams per square foot of BHC (95 percent gamma isomer) have continued to compare favorably with deposits of 100 and 200 milligrams of DDT per square foot during the period from 21 to 33 weeks after spray application in 60-minute exposures of adult *Anopheles quadrimaculatus*. Deposits of 200 milligrams of compound 118 per square foot showed loss of effectiveness from 12 to 27 weeks after spray application. Comparisons between compound 497 and DDT against *A. quadrimaculatus* females were made, using 30- and 60-minute exposures to 100 and 200 milligrams per square foot deposits of each insecticide. Initial effectiveness of 497 was inferior to that of DDT. Deposits of 497, however, gradually increased in effectiveness, and excellent results were obtained through the period of 8 to 17 weeks after spray application. Combined deposits of DDT and methoxychlor have been more effective than either DDT or methoxychlor alone in preliminary evaluations.

Investigational Work on House Fly Larvicides. Five milliliter amounts of 5, 3, or 1 percent DDT or toxaphene emulsions sprayed on 1,000 grams of National Association of Insecticide and Disinfectant Manufacturers (NAIDM) medium -1, 1, and 3 days of age with relation to the introduction of 1st instar larvae gave better than 95 percent control as measured by pupal and adult mortalities. Neither DDT nor toxaphene emulsions applied at 5 days of age were effective. Methoxychlor emulsions were ineffective in all tests. Emulsions of compound 118, compound 497, or BHC have given 100 percent control under similar test conditions.

Investigations on the Relationship between the Physical State and Insecticidal Action of DDT and Other Synthetic Insecticides when Applied on Solid and Liquid Surfaces. Five percent DDT solutions in a series of 15 solvents were sprayed on glass test panels at the rate of 100 milligrams of DDT per square foot, and allowed to remain undisturbed for a 4-week period. With 2½-minute exposures of adult house flies, 24-hour mortalities greater than 75 percent were obtained from 10 test deposits only. Differences in effectiveness did not correlate with any group of related solvents. Considerable evidence has accumulated to show that the evaluation of insecticidal deposits by knock-down time alone is not satisfactory for purposes of comparison and should be substantiated by 24-hour mortality.

Formulations of DDT known to produce different crystal habits were sprayed on glass at the rate of 100 milligrams of DDT per square foot, and complete crystallization was produced by rapid temperature changes. The 50 percent knock-down time and the effect of insect activity on the crystals was measured after 1, 3, 6, and 16 exposures to test insects. Flat, horizontal, dendritic crystals (from xylene emulsion) withstood insect activity better than the spherulitic or fragmental types of crystals. Deposits which were giving unsatisfactory knock-down after 16 exposures to insects showed a slight temporary reactivation when sprayed with acetone.

DDD, methoxychlor, toxaphene, chlordan, and BHC in Deobase, xylene, and acetone solutions or xylene emulsions were sprayed on glass panels, and the rate of crystallization and crystal habits were determined. DDD and methoxychlor crystallized gradually in 1 to 8 weeks. The crystals were mostly spherulitic and masses of both needles and prisms. No crystalline structures were found with toxaphene and chlordan, while BHC was completely crystallized into small fragments within 1 week after application.

Deposits of 100 milligrams per square foot of DDD, methoxychlor, BHC, chlordan, and toxaphene in Deobase, xylene, acetone solutions, and xylene emulsions were prepared on glass panels. After exposure to 4- to 6-week-old prepa-

rations, the time required for 50 percent knockdown of house flies was 2 hours or more with BHC, chlordan, and toxaphene deposits but comparatively rapid with DDD and methoxychlor deposits. Exposure of adult flies for 15-minute periods to these deposits did not give 100 percent 24-hour mortalities in any case. Methoxychlor seems to be more effective than the other insecticides tested on the basis of this one test.

Mosquito Larvicide Investigations. Portions of fresh solutions of 5.0 and 0.6 percent DDT in pentachlorethane, No. 2 fuel oil, and cyclohexanone were stored in the dark, exposed to room light, and to sunlight for 2 weeks, and then tested on water at a rate equivalent to 1 gallon per acre against *A. quadrimaculatus* larvae. All solutions exposed to sunlight showed decreased insecticidal activity with the greater decrease in the 0.6 percent solutions. One application of heavy artificial rainfall (approximately 7 inches) to test DDT oil films greatly impaired the effectiveness of the film.

Five percent acetone solutions of DDD, BHC, methoxychlor, toxaphene, and chlordan were applied on water at a rate equivalent to 1 gallon per acre, and the rate of crystallization was observed. DDD and BHC crystallized soon after application, methoxychlor after 3 days, while toxaphene and chlordan remained as small lenses.

Of 5 percent xylene emulsions of BHC, toxaphene, methoxychlor, chlordan, DDD, and DDT at a rate equivalent to 1 gallon per acre, only DDD and methoxychlor compared favorably with DDT against *A. quadrimaculatus* larvae.

In field tests, 5 percent DDT solution in liquid petrolatum and paraffin-wax jelly, at 1/8 gallon per acre, maintained effective control through the 4th day; early 3d instar larvae appeared on the 7th day; and pupae appeared after 13 days.

Five percent solutions of various chlorinated insecticides were applied to water and allowed to age for 3-6 weeks before testing. It was concluded that mere aging of the insecticide film was enough to impair its biological effectiveness.

CHEMICAL STUDIES

Stability Tests on Emulsions of Compound 497 at Varying Dilutions. Emulsions containing 0.313, 0.625, 1.25, and 2.5 percent of compound 497 were prepared from 25 percent weight/volume xylene concentrates prepared with both Triton X-100 and Triton X-155 at 2 milliliters/100 milliliters with and without the addition of 10 percent of pine rosin as an adhesive. The emulsions with Triton X-100 containing 0.313 and 0.625 percent of 497, with and without rosin, and the emulsions of each concentration with Triton X-155 containing rosin were superior in stability to a standard 5 percent emulsion of DDT prepared as a 25 percent w/v xylene concentrate with Triton X-100. The emulsions with Triton X-100 containing 1.25 percent and 2.5 percent of compound 497, with and without the addition of rosin, and the emulsions of each concentration with Triton X-155, without rosin, were inferior to the same standard.

Volatility of DDT, Methoxychlor, and DFDT from Residual Sprays on Smooth Surfaces. Determinations were made of the sublimation rates of deposits of 400 milligrams per square foot of methoxychlor, DDT, and DFDT from a glass surface. The loss of methoxychlor, DDT, and DFDT over a period of approximately 9 weeks was 4.4, 15, and 95 percent, respectively, when deposited from a 5 percent Deobase solution, and 1.4, 4, and 66.7 percent when deposited from a 5 percent ethyl methyl ketone solution.

The lower losses of methoxychlor and DDT from glass surfaces compared to that of DFDT can be explained on the basis of the higher vapor pressure of DFDT which is known to be some 15 times that of DDT. The difference in the sublimation rates of the deposits of the three compounds from Deobase and ethyl methyl ketone appears to be related to the characteristics of the crystalline deposits from the two solvents.

EQUIPMENT DEVELOPMENT

"Package Unit" Aircraft Insecticide Spraying System. Two completely portable spraying systems suitable for use in various types of lightweight airplanes have been tested in a model J-3 Piper Cub plane. One system employs a conventional wind-driven spur gear pump for developing spray pressure, while pressure in the second system results from the use of compressed CO_2. Satisfactory particle size, swath width, and dosage were obtained from both

systems. This type of insecticidal dispersal from light-weight rented airplanes is designed to provide a ready method for treating insect-infested areas during times of epidemics or disasters at a minimum of stand-by expense.

Rain Machine. The effects which wind and rain have on a larvicidal film floating on a water surface were studied by use of a specially constructed piece of equipment termed a " rain machine." A two-compartment pan was designed to drain excess water from the container without wasting the floating larvicide. Wind or rain could be directed onto the treated surface at will, and any resulting deterioration in the larvicide was tested by noting the decrease in toxicity to newly introduced mosquito larvae. Results of tests performed using this equipment are found under "Insecticide Studies" above.

TOXICOLOGY

Rodenticide Studies. A cafe remained moderately infested with Norway rats after permanent bait stations with 1080 had been in place 6 weeks; and a poultry store remained lightly infested after 9 weeks. More favorable results were obtained in 23 days in a bakery where food and water were not so readily available to the rats. Rats did not enter the bait stations frequently until the stations had been in place 2 or 3 weeks, and it was apparently even later that they began to take bait.

Thirteen of 17 Norway rats previously poisoned by voluntarily eating 5 milligrams per kilogram of ANTU in bait refused ANTU in the same bait, while only 2 of 17 similar rats refused ANTU in the new bait. Considering only rats which took some bait, those that had been previously sublethally poisoned took only about half as much as did controls which had never encountered the poison before.

In two simulated field tests, the mortality among Norway rats previously sublethally poisoned with ANTU was significantly less that that of previously unpoisoned controls. There was evidence of bait refusal but not of tolerance.

Only 5 of 10 *Rattus norvegicus* and 6 of 10 *R. rattus* died when offered dicoumarin at the rate of 1.0 milligram per gram of bait for 2 weeks, although acceptance remained good in the presence of a poison-free bait. A dosage of 2.0 milligrams per gram of bait was necessary to kill all rats of both species in a 2-week period. In entirely comparable tests with compound 42, all rats were killed in less than 2 weeks at the lowest bait concentrations studied (0.2 milligrams per gram for *R. rattus*). Acceptance of compound 42 was satisfactory. In stomach tube tests, four of five white rats survived a single dose of 30 milligrams per kilogram, while none in five survived five daily doses of 5 milligrams per kilogram. In simulated field studies, all of 107 Norway rats were killed when compound 42 at the rate of 1.0 milligram per gram of bait was left in the building for 6 days, while 14.8 percent survived in a similar test where the bait remained only 5 days.

VECTOR-TRANSMISSION STUDIES

Transmission of Murine Typhus. Studies of cannibalism as a possible mode of direct transmission showed that if infected animals weakened by cold or intercurrent disease, were eaten by susceptible rats, transmission often resulted. However, if infected rats of normal resistance and metabolic rate were so eaten, no transmission occurred. The possibility that transmission of murine typhus from rat to rat may occur in nature through cannibalism and without the intervention of any ectoparasite is definitely established. The actual importance of such transmission in maintaining a focus of typhus in a rat population whose ectoparasites (fleas and lice) have been reduced to a minimum would depend on various factors which cannot be evaluated at this time.

Of 98 Norway rats taken from a local undusted city dump, all were infested with *Polyplax spinulosa* and 13 with *Liponyssus bacoti*. No fleas were found. No strain of typhus was isolated when 4,295 lice and 145 mites were injected into 74 test animals. The percentage of complement fixation-positive rats at the city dump was extremely low as compared with that of rats in urban Savannah or the Southeast generally.

Training

FIELD TRAINING

Cincinnati, Ohio. A 3-week advanced training course for State bacteriologists primarily concerned with water or milk analyses or food utensil examinations was completed on April 8, 1949. A 2-week advanced training course for sanitary engineers in stream pollution abatement programs was conducted from April 25 to May 6. Twenty-four trainees were enrolled in this course, including one from India and one from Puerto Rico.

The training laboratory, which was moved to 1014 Broadway on March 15, has been equipped for chemical work. Sufficient field and laboratory equipment has been ordered to enable good biological demonstrations to be given in stream pollution abatement.

Columbus, Ga. The sanitarians course, which began February 7 with 16 trainees enrolled, was completed April 29. A short course in laboratory-controlled food and utensils sanitation was conducted during the period June 13-17.

A field training course for sanitary engineers was begun at this station June 20, with 14 trainees enrolled --- 8 of them representing foreign countries.

Denver, Colo. The first 12-week course for sanitarians was begun April 4 and continued through June 24. Seven trainees were enrolled.

A meeting of the Rocky Mountain Training Center Advisory Committee was held June 7 for the purpose of discussing current needs of this region for training of sanitation personnel. The following dates were set for the next two 12-week courses: September 19-December 9, 1949; and March 6-May 26, 1950.

Savannah, Ga. The course for public health educators which began March 22 continued until May 28. Another course for public health educators began June 27 and will continue through September 10.

The training officer participated in the Florida State Training Station program. Health education, publicity, and public relations were discussed with 10 trainees, 8 of whom were sanitation officers and 2 of whom were nurses.

Complimentary copies of all health textbooks used in elementary and junior high schools were requested and received for the Health Department Library. These books are available for perusal by teachers, principals, and consultants in the city and county.

Topeka, Kans. A 2-week milk sanitation course was held April 25-May 7. Certificates were issued to nine trainees who completed the course. Three trainees attended part-time.

During June 6-18, eight trainees attended a 2-week eating and drinking establishment sanitation course given at this center.

Personnel from this center presented the milk sanitation section of the 3-month environmental sanitation course held at Denver, Colo. They also assisted in arranging the program for a 1-week in-service milk and food sanitation short course scheduled July 18-22 at Sylvan Lake, S. Dak. This program is sponsored jointly by the South Dakota State Health Department, the North Dakota State Health Department, South Dakota State College, U. S. P. H. S. Region 7, and the Communicable Disease Center (Topeka Field Training Center).

Troy, N. Y. The fourth 12-week field training course for sanitary inspectors was completed in May. A 5-day short course on municipal and rural waste disposal was conducted May 2-6 at the University of Massachusetts. Personnel from this station presented talks at the course and assisted in the field trips.

STATE FIELD TRAINING

(Cooperative Enterprises)

A 5-day insect and rodent control course was conducted for sanitarians of the Louisiana Department of Public Health during May 30-June 3. It was the sixth program of that type given in cooperation with the Louisiana Department of Public Health training center as part of the regular 11-week field training programs conducted for sanitarians.

The Department of Field Training, School of Public Health, University of North Carolina, sponsored two regional conferences to consider

problems involved in the recruitment and training of public health personnel. The first conference was held in Raleigh and Chapel Hill, and the second conference in Atlanta. A third conference was scheduled in June to consider the recruitment and training of sanitation personnel. Consultant service has been given the Georgia State Health Department and the Georgia Training Committee looking to the development of plans for field training activities for health officers, sanitarians, and nurses. Considerable effort was devoted during the quarter to planning the integration of the Department of Field Training into the School of Public Health and in defining the functions, responsibilities, and relationships of the Department to the other Departments of the School.

HEADQUARTERS TRAINING

Two 1-week field training courses in fly control were conducted in Atlanta during April 25-29 and May 9-13, and were attended by 18 and 19 persons, respectively. The first course was arranged principally for Engineering Division personnel assigned to CDC fly control projects and for CDC representatives in various State and regional offices. The second course was arranged for Public Health Service and State health department personnel engaged in fly control activities. Emphasis was placed on sanitation techniques that are useful in preventing fly breeding and in ground operated power insecticidal units.

The first two of the series of five 2-week training programs in insect and rodent control, especially designed for foreign public health workers, were conducted during the quarter. These courses were also open to U.S.P.H.S. workers.

A 1-week fly control training course was conducted in Charleston, W. Va., for 14 sanitarians and 2 other employees of the West Virginia Department of Health.

A 3-day seminar on insect and rodent control was conducted at the School of Public Health, University of Michigan, May 2-4. This seminar was attended by 23 University of Michigan candidates for master of public health degrees (mostly engineers), 12 to 15 sanitarians in the Michigan State Health Department, 4 University of Michigan faculty members, and 3 pest control operators.

A 5-day insect and rodent control field training course for M.P.H. candidates of Tulane University was conducted May 16-20. Most of the time was devoted to field participation by the trainees.

Special observation and training courses were arranged for 37 public health personnel from 20 foreign countries: Australia, Bolivia, Brazil, Ceylon, Chile, China, Equador, Egypt, England, India, Iran, Italy, Lebanon, Mexico, Peru, Philippines, Sweden, Thailand, Turkey, and Venezuela.

A 5-week course in "Appraisal Method for Measuring the Quality of Housing" was conducted during May 16-June 17. Another class on the subject was held in Syracuse, N. Y., April 20-June 3.

A 1-week housing symposium was held for regional public health engineers.

Veterinary Public Health

Graduate Training. Two courses in the principles and practice of veterinary public health were incorporated into the curriculum of the Department of Public Health Practice of the Harvard School of Public Health. These courses, under Dr. Raymond Fagan, CDC veterinary officer assigned to the Harvard faculty, are the first formal courses in veterinary public health to be organized in a graduate school of public health.

Rabies Control. The United States-Mexico Border Conference on Rabies was held April 26 at Nogales, Ariz. A review of the rabies problems and plans for control were presented by rabies control officials of Mexico, Texas, Arizona, New Mexico, and California. Dr. Steele represented the U. S. Public Health Service and presented plans for the CDC national rabies control program. Resolutions were adopted to stimulate exchange of information and foster cooperative control procedures in both countries

in the border area. These cooperative programs will be administered by the Veterinary Public Health Section of the Pan American Sanitary Bureau, Washington, D. C. Dr. Benjamin Blood was appointed to head this Section. The Communicable Disease Center will contribute to the border program by offering its training facilities as well as the benefit of its experiences in laboratory research, diagnostic techniques, immunization procedures, and field demonstration control projects.

The second scheduled course in the "Laboratory Diagnosis of Rabies" was given April 25-29 at the laboratories of the Communicable Disease Center in Atlanta, Ga.

Consultation services, as a result of inquiries and requests with regard to specific problems of rabies control and laboratory diagnostic techniques, were supplied to Rome, Italy; Dominion of Canada; Madras, India; and the States of California, Florida, Indiana, Illinois, Kentucky, Maine, Ohio, Pennsylvania, Virginia, Washington, Tennessee, and Alabama.

Of special interest was a dog brain specimen sent into the laboratory by the Georgia State Health Department where it had been diagnosed as pseudorabies. This diagnosis was confirmed at the CDC Rabies Laboratory at Montgomery by further mouse passage and by serum neutralization tests against Rockefeller Institute for Medical Research and Dothan strains of pseudorabies virus.

The Rabies Laboratory at Montgomery is continuing studies on the effect of antibiotics on rabies and pseudorabies viruses; the effect of serum inactivation on the neutralization titers in serum neutralization tests for rabies antibodies, and mouse protection tests on chick-embryo live-virus vaccines and vaccine dosage experiments.

During the past quarter, rabies control activities in Indiana were concentrated along the lines of public information and education. Present laws in this State earmark all money collected as dog license fees for use in the payment of livestock indemnity and/or human Pasteur treatment without providing any of this fund for actual control activities. Active citizen committees for rabies control have been organized in Lake, Harrison, Porter, Delaware, and Vanderburgh Counties. These committees have directed their efforts toward establishing animal shelters for stray dogs, organizing vaccination clinics, reviewing and revising antiquated city dog ordinances, devising plans to enforce license ordinances, and preparing educational material for use in press, radio, and local clubs. The cities of Gary and Hammond have undertaken the development of complete rabies control programs.

In Texas a survey was carried out to determine the State economic loss due to rabies. Worked out on a per capita basis, the State was divided into the following areas for purposes of the survey: epizootic rural areas (i.e. areas of heaviest livestock loss); epizootic urban areas (i.e. heavily populated areas); enzootic areas. The loss was found to be $1.00, $0.50 and $0.10 per capita, respectively, in those areas listed. The total annual cost to the State was estimated at a minimum of $2,700,000.

A campaign to make dog shelters available for the collection of strays in every local health jurisdiction in Texas is now being launched. Consultation services on the proper construction of a dog pound is being offered by the Veterinary Public Health Services of the State health department. Austin and Travis County continue to have effective control, and plans have been made for similar programs in the surrounding counties.

Course in Radiological Defense. Dr. Harry Rubin, Montgomery, Ala., attended a 6-week course in radiological defense at Keesler Air Force Base, Biloxi, Miss. The course dealt with the nature of atomic bomb bursts, their effects, and measures to be employed in minimizing the hazard from radiation. The laboratory exercises throughout the course were largely concerned with the use and application of various radiation detection devices and the machines and methods used in their calibration. Many practical problems were solved.

Q Fever Studies. Surveys in southern California have shown that of several hundred specimens collected from goats during this quarter, only two goat dairies have been free of *Coxiella burneti* infection. Rates in animals as high as

60 percent and titers as high as 1/1280 have been found on certain commercial goat dairies. Evaluation of the presence of the organism in the milk of these goat dairies has not yet been made. In other studies in the same region, there has been no evidence thus far to implicate pets with this infection. Evidence seems to point toward air-borne and/or milk-borne route of infection. In dairy cattle, 17 percent of one herd was found to be infected before their first parturition. These results seem to eliminate milking as a cause of infection in this particular herd. Ear ticks, dust, and animal secretions are still being investigated. Placental tissues and fluids are highly suspicious as a source of air-borne infections.

In the northern and central California studies sponsored by the State health department, preliminary serologic tests on animals associated with human cases suggested that sheep and goats were implicated in the epidemiology of this disease. During the month of May an outbreak of human Q fever was noted in Colusa, a small Sacramento Valley town. Intensive epidemiological surveys revealed that the only possible source of infection here was the herding of flocks of sheep through the town 2 weeks previously. Follow-up of these flocks revealed positive reactors. Dust and air samplings of locations where flocks were herded were taken. These specimens now are being worked on for possible *Coxiella* isolations. Extensive work has begun on general serologic surveys of livestock in central and northern California as well as abattoir sampling. Outbreaks of undiagnosed suspicious illnesses in livestock are being investigated. Intensive studies have been started on an experimental flock of naturally infected sheep at the University of California at Davis. Samples of blood, urine, feces, milk, nasal and oral secretions are being checked at regular intervals. In serologic survey, it was noted that positive lambs come from positive ewes and that negative lambs come from negative ewes.

Recent surveys have revealed evidence that Q fever is enzootic in the cattle herds of south Texas, as shown by serologic titers and milk isolations. Five percent of the packing house workers of Dallas, Fort Worth, and San Antonio have Q fever titers.

Brucellosis. Studies on brucellosis are continuing in Indiana, Wisconsin, Texas, and Florida through the respective State health departments. In Wisconsin and Indiana, epidemiological studies are being carried out on positive human cases, confirmed by blood culture, and on animal contacts and associations. Progress reports of brucellosis surveys were presented in Indiana at a meeting of the local health officers of that State and at a conference of research workers at Purdue University. In Texas, surveys of swine brucellosis and its effect on human and bovine incidence are continuing.

In Florida, comparisons of serum agglutination tests, ring tests, and whey tests were made in the examination of 68 herds. The ring test detected the presence of infection in all herds in which positive blood reactors were present. A group of blood reactors was studied, and it was found that blood and ring reactions closely correlated in these animals. The ring test was found more sensitive than the whey test in detecting infection in individuals and in herds. Evidence thus far points to the reliability of the ring test in these studies.

A study in Utah on 6,250 unselected human sera demonstrated that 4.43 percent had antibodies in 1:25 dilution. Only 2 or 0.6 percent of all the clots cultured yielded positive isolations of *Brucellae*.

Creeping Eruption. This human skin disease, caused by infestation of larvae of the dog hookworm, *Ancylostoma braziliense*, has caused a great deal of concern in the South Atlantic and Gulf States. Surveys in Texas reveal highest incidence in areas of heavy human and dog populations where the land is flat, beaches are numerous, and the water level is high on account of poor drainage. Most of the routine reports in Texas come from the Rio Grande Valley and Harris, Travis, and Dallas Counties, low areas of heavy population.

In Florida, dog hookworm (*A. braziliense*) surveys are under way as part of an investigational project on creeping eruption where 8,000 cases were reported by 550 physicians. Method-

ology research is now being carried out to determine the best sampling techniques from autopsies and from purged stools obtained from various veterinary clinics. Thus far the best technique at autopsy is the opening and examination of the entire small intestine under running tap water; the hookworms then are picked off by means of forceps and shipped to Atlanta in 10 percent formalin for identification.

Industrial Anthrax Study. For the purpose of investigating and controlling a rise in the cases of industrial anthrax in the United States, particularly in the northeastern States, a cooperative project was inaugurated with the Industrial Hygiene Division. The proposed study will consist of three phases:

I. A sampling survey of hides, hair, wool, etc. of foreign origin to determine the frequency of anthrax spore contamination.

II. Investigation of human cases of industrial anthrax. Epidemiological surveys will be made on past and future cases to determine the suspected source of infection (i.e. type of product), country of origin, consigner, and port of entry.

III. Investigation of sterilization methods of hides, hair, wool, etc.

Salmonellosis. During the quarter, at the Florida Public Health Laboratory, a survey of 992 dogs and 26 cats showed a Salmonella infection rate of 15.4 percent with 18 different Salmonella types, many of which are human pathogens. Early in this study it was noted that *Proteus* organisms apparently predominate in the normal intestinal flora of dogs, contrary to the report of Craig (J.Am.Vet.M.A., CXIII: 154, 1948). *Pseudomonas* organisms are also present in high percentage, but they do not seem to interfere with the isolation of *Salmonella.*

It was found that *Proteus* were consistently mixed with the *Salmonella,* thereby making it difficult to isolate the latter in pure culture. In some instances *Salmonella* may be missed entirely. Studies are in progress to modify the enrichment broth (Tetrathionate --- brilliant green bile broth) by adding a chemotherapeutic or antibiotic agent which will inhibit *Proteus* and allow *Salmonella* to grow undisturbed. Thus far, controlled experiments have shown that sulfathiazole added to the enrichment broth has substantially increased the number of Salmonella isolations.

Dr. Joseph Ruhe resigned effective June 1, 1949. Dr. Robert Menges was transferred from the Michigan Department of Health to the Histoplasmosis Laboratory, University of Kansas Medical Center, Kansas City, Mo., to replace him.

CDC Training Courses

Listed below are training courses, sponsored by Divisions of the Communicable Disease Center, to be held in the near future. Further information on the courses may be obtained from the *Bulletin of Field Training Programs*, issued by the Training Division.

TRAINING DIVISION

1. **PRACTICAL FIELD TRAINING FOR SANITARY INSPECTORS**, January 3 to March 24, 1950. Twelve weeks. Amherst, Mass.

2. **APPRAISAL METHOD FOR MEASURING THE QUALITY OF HOUSING**, January 9 to February 10, 1950, and March 13 to April 14, 1950. Five weeks. Atlanta, Ga.

3. **APPRAISAL METHOD FOR MEASURING THE QUALITY OF HOUSING**, January 23 to February 24, 1950, and March 27 to April 28, 1950. Five weeks. Syracuse, N. Y.

4. **RAT-BORNE DISEASE PREVENTION AND CONTROL**, March 13 to March 31, 1950. Three weeks. Atlanta, Ga.

5. **ADVANCED TRAINING COURSE FOR STATE BACTERIOLOGISTS PRIMARILY CONCERNED WITH WATER OR MILK ANALYSES OR DAIRY PRODUCTS AND FOOD UTENSIL EXAMINATIONS**, February 27 to March 17, 1950. Three weeks. Cincinnati, Ohio.

6. **ADVANCED SANITARY ENGINEERING TRAINING IN WATER POLLUTION ABATEMENT PROGRAMS**, March 20 to March 31, 1950. Two weeks. Cincinnati, Ohio.

7. **ENVIRONMENTAL SANITATION FIELD TRAINING**, February 6 to April 28, 1950. Twelve weeks. Columbus, Ga.

8. **RESTAURANT SANITATION**, January 9 to January 27, 1950. Three weeks. Topeka, Kans.

9. **ENVIRONMENTAL SANITATION FIELD TRAINING**, February 6 to April 29, 1950. Twelve weeks. Topeka, Kans.

LABORATORY DIVISION

1. **SEROLOGICAL DIAGNOSIS OF RICKETTSIAL DISEASES**, January 9 to 13, 1950. One week. Atlanta, Ga.

2. **IDENTIFICATION OF MEDICALLY IMPORTANT ARTHROPODS**, February 13 to 24, 1950. Two weeks. Atlanta, Ga.

3. **LABORATORY DIAGNOSIS OF PARASITIC DISEASES, Part 1, Intestinal Parasites**, March 27 to April 14, 1950. Three weeks. Atlanta, Ga.

4. **LABORATORY DIAGNOSIS OF PARASITIC DISEASES, Part 2, Blood Parasites**, April 17 to May 5, 1950. Three weeks. Atlanta, Ga.

NOTICE

The *quarterly* CDC Bulletin will be discontinued after this issue. Effective January 1950, the Bulletin will be issued as a *monthly* publication.

FEDERAL SECURITY AGENCY

Material in this bulletin is not for publication.

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