ATOMIC PHYSICS

An authoritative film on the history and development of Atomic Energy

A **G-B INSTRUCTIONAL LTD** ***Production***
THE J. ARTHUR RANK ORGANISATION LTD

THE FILM AND ITS MAKING

SOME TIME early in 1945, Mr. Donald Carter, Executive Director in charge of production for G-B Instructional Ltd., began to think seriously about making a film on The Atom. The sudden disclosure to the world that atomic bombs existed and could be used with devastating effect turned the spotlight of world public opinion on to the whole subject of nuclear physics.

It became increasingly clear that there was need for a film which would tell the fascinating story of the rapid development of this subject: the astonishing series of brilliant discoveries made over the last 50 years by men of many nations, and not least by British scientists: how nuclear physicists suddenly saw the possibility of the release of nuclear energy leap from an intellectual conjecture to a dramatic possibility; and how the tragic circumstances of the world at that time dictated that the first release of atomic energy on a grand scale should be as a destroyer rather than a benefactor of mankind.

Such a film was needed to put the subject into something like correct perspective in the minds, not only of students, but of serious and intelligent audiences wherever such a film might reach them. Primarily the film must be of positive value to educationists, but its wider use was not to be lost sight of.

The Planning of the Film

These conclusions reached, Mr. Ian Crémieu-Javal, managing director of G.B.I., agreed that preparation for production should start under the supervision of Mr. Frank Wells, associate producer in charge of educational films. Initial research and the production of a first draft treatment were undertaken by J. V. Durden, B.Sc., who was given valuable guidance by Professor G. I. Finch, M.B.E., F.R.S., of the Imperial College of Science.

At this stage the writing and direction were taken over by Mr. Derek Mayne. Before the war Mayne, after leaving Oxford with an Honours Degree in Modern Languages, had spent several years in the film industry and the last four of his six years in the Army as an officer of the Army Film Unit in the Western Desert and other parts of the Near East. After the war he had joined G.B.I. in order to concentrate on documentary and instructional film making.

Not the least achievement in the film is this layman's mastery, in two years, of the immensely abstruse conceptions of atomic physics. The commentary, written by Mr. Mayne, is also spoken by him.

As a worthy assistant he had Mr. S. G. Fergusson, whose scientific background and experience in the use of instructional films as an

instructor at the School of Anti-Aircraft Artillery made him an excellent choice.

More study and research followed. The treatment was broken down, moulded into fresh shape. As a clear line of approach emerged, the final script took shape.

Opinions on it were sought from such authorities as Dr. J. D. Cockcroft, Professor Peierls of Birmingham University, Professor Frisch, now at Cambridge. Valuable suggestions were received.

Professor Einstein was good enough to express approval and agreed to appear in special scenes for the film. Dr. Cockcroft and Professor Frisch, who have been so closely associated with the most important advances in nuclear physics, both recorded interviews specially for the film.

Invaluable Help

A great number of scientific institutions and research laboratories agreed to provide facilities for sequences to be shot showing in some cases the latest types of research and in others original apparatus used in important experiments of years gone by.

To mention only a few of the many bodies to whom gratitude must be expressed, the Royal Society, the Royal Institution, the Cavendish Laboratory, the Science Museum, the Physics Department of the Imperial College, the Research Laboratories of G.E.C. (England), the X-ray Schools of Messrs. Kodak and the Research Laboratories of Cinema Television, gave magnificent help even at the cost of inconvenience because of their own programmes of work. Lastly, the Atomic Scientists' Association arranged for one of their members to give consistent technical guidance throughout.

And even this was only half the battle. In order to make the invisible appear upon the screen, recourse was necessary to animated diagram on a scale seldom attempted previously for scientific films. Mr. David Hand, of G-B Animation Ltd., deputed Mr. R. Jeffryes and a team of skilled animators to work this out with the director.

Included in the film are actual scenes of Lord Rutherford and Sir Joseph Thomson recorded before they died. Original apparatus used by Sir J. J. Thomson, Lord Rutherford, H. G. Moseley and Cockcroft and Walton is used in various scenes, as well as an accurate copy of apparatus used by Michael Faraday.

So, step by step, using animation, historical reconstruction, living speakers, original apparatus and scenes of modern research, the film achieved completion. It falls naturally into five parts which can be run as one film or separately.

Hire and purchase terms are given overleaf.
Foreign language versions are now being made.

The Film in Outline

(The Catalogue numbers are given in brackets)

Part I—The Atomic Theory starts with the theory as proposed by John Dalton in 1808 and outlines the progress of the nineteenth century, bringing in Faraday's early experiments in electrolysis, Mendeleeff's Periodic Table, and ending with ideas of the size of molecules and atoms which were then current. *1 reel (F. 4580)*

Part II—Rays from Atoms demonstrates how Cathode Rays were investigated and the electron discovered : how positive rays were found and their nature established : how X-rays were found and quickly put to use. The great work of Sir Joseph Thomson is emphasised.

2 reels (F. 4598)

Part III—The Nuclear Structure of the Atom reconstructs the early work of Becquerel and the Curies on radioactivity and shows how Lord Rutherford's work in this field led to his theory of the Nuclear Structure of the Atom. H. G. Moseley's brilliant work in support of this theory is visually shown by animated diagram. *2 reels (F. 4599)*

Part IV—Atom Smashing : The Discovery of the Neutron. In this part the research tools of Nuclear Physics are described and shots of the extraordinary machines now used to bombard atoms are shown.

The work of the Joliot Curies and Sir James Chadwick in the discovery of the neutron is explained and its outstanding importance driven home.

The splitting of the lithium atom by Cockcroft and Walton in 1932 is discussed and a speech by Professor Einstein explains how their work strikingly illustrated his theory of the equivalence of mass and energy.

2 reels (F. 4600)

Part V—Uranium Fission : Atomic Energy. Finally, the events of recent times leading up to the discovery of uranium fission are brought in, and the principal facts of uranium fission explained in detail. A speech by Professor Frisch, who was closely concerned in this work, is included.

The film now moves quickly towards its climax, explaining why it seemed possible to make an atomic bomb and showing shots of the great plants in America where this work was done ; also the ruins of Hiroshima.

Some idea is given of the present-day research into peaceful uses of Atomic Energy, and this prospect is discussed in speeches by Professor Einstein and Dr. Cockcroft, head of the British Project for Research on Atomic Energy.

The film ends with a valuable recapitulation and a word about the future which promises so much if peace remains unbroken. *3 reels (F. 4601)*

Age Group

The film is designed for use in the Science Departments of Universities, Technical Colleges and institutions of similar standing, and of such schools as take fairly advanced Physics. Part I is, however, suitable for science pupils of 15 plus.

The five parts are so designed that each can be used independently.

Hire and Sale Terms (16 mm.)

Hire: Single reels, 1st day 10s. Each subsequent day 2s.6d.

Sale: Per reel £12 10s., 4 reels or over £11 11s. per reel. Complete film (10 reels) £105.

When ordering please state catalogue numbers quoted above, and if for hire, date the film is required and number of days you wish to retain it. Apply to :

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