in fly control, as impracticable because of reinvasion, difficulties in accomplishment and unreliability in a partially settled country.

This report is itself a summary, and a review must be wholly inadequate in presenting the riches of experiment in laboratory and field, and the extraordinarily diverse aspects of the problems discovered and attacked. Certain practical results are enumerated and lines of endeavor in control tested and judged in the light of results. A few of the significant conclusions are as follows: Each species of fly and each biotic area must be studied in detail before control measures should be undertaken. In studying the problems each suggestion arising from observations in the field was examined as to its feasibility, practicability, difficulties, cost and effectiveness, tested in the laboratory and on a small scale in the field, and then on a control basis. As a results of such studies recommendations are made for cessation of annual burning of the bush by the cattle-grazing natives, the building up of fly barriers by native bush, preferably evergreen, which are traversed slowly if at all by the fly, clearness of infested fly territory by native settlement, control of plant associations and methodical trapping of flies of certain species in certain territories till they are so reduced in numbers that human occupation can continue. Roads through fly country can be made safe by clearing, and fly concentrations can be isolated in like manner. In general the author favors policies of control by knowledge of the ecological factors most accessible to economical change and most potent in each ecologic niche in reducing the mass of the tsetse menace below the level of human disaster. Extermination is out of the question. Even then the enormousness of the task for tropical Africa is appalling.

As an example of practical ecological investigation and resulting control measures this investigation is outstanding in its magnitude, scope and accomplishments. It is a far-sighted, wide-visioned and skilfully operated attack upon one of the most tragic, complex, intricate and perplexing problems in parasitic ecology facing human civilization in a great continent.

One encouraging feature is the tribute paid to native helpers for their industry, faithfulness and inventiveness in attacking these problems.

CHARLES A. KOFOID

TELEVISION

Electron Optics in Television. By I. G. MALOFF and D. W. EPSTEIN. McGraw-Hill Book Company.

WHEREAS it might seem that electron optics in television was a rather specialized subject, of interest to communication engineers rather than to physicists, the book is of somewhat broader scope than is indicated by its title.

In the first 40 pages of introduction, the authors give a good review of current cathode ray television technique, with particular emphasis on various scanning and viewing devices. They then develop the subject of electron optics. First they consider the emission of electrons from various sources. The treatment is clear, and this portion of the book might form a useful text for teaching. The next subject to be considered is the analogy between electron optics and light. There follows a detailed treatment of electron optics, covering the trajectories of electrons in fields of various geometries. Electrostatic lenses and the defects and aberrations which these show are discussed at some length, as well as the techniques used to overcome these errors.

Then, deflection of electrons in magnetic fields and various types of magnetostatic lenses and focussing are described. This discussion of electron optics is unusually complete, and will, no doubt, be of value to all physicists dealing with electronic or molecular beams, be they in mass spectrographs, cyclotrons or Van de Graaf generators.

The second portion of the book deals with the television cathode ray tube itself. First, the electron gun is described, and the deflection of the beam, the types of luminescent screens and various ratings and classes of tubes. Finally various accessories are explained, most of which are circuits for special purposes, such as relaxation oscillators, impulse generators, multivibrators and driving circuits. The final chapter will seem to many physicists to be a rather elementary discussion of vacuum technique. The second portion of the book is more specialized and perhaps not of as great interest to physicists generally as the first. Throughout, the figures are clear, and the book will make a useful addition to a physics library.

S. A. KORFF

BARTOL RESEARCH FOUNDATION OF THE FRANKLIN INSTITUTE,
SWARTHMORE, PA.

REPORTS

THE RESEARCH COUNCIL ON PROBLEMS OF ALCOHOL[1]

THE American Association for the Advancement of Science, through its permanent secretary, Dr. F. R. Moulton, made on October 3 the first public announcement of a new approach to the liquor problem through the launching of an associated organization known as the Research Council on Problems of Alcohol, the present membership of which includes nearly 100 distinguished scientists and educators from various sections of the country, as well as a group of citizens prominent in public and industrial life. The plan of the council,

[1] Press release from the office of the permanent secretary of the American Association for the Advancement of Science.

it is stated, is to make a "thorough, unbiased and strictly scientific investigation of the problems related to the control of alcoholic beverages and to seek solutions through a program of unprejudiced research and education." Dr. Moulton stated that this program is regarded as ranking in importance with the symposia sponsored by the association on such problems of public health as cancer, tuberculosis, leprosy, syphilis and mental health.

Dr. Karl M. Bowman, director of psychiatry at Bellevue Hospital and professor of psychiatry in New York University, is chairman of the fifteen-man executive committee, of which ten are required to be scientists. Dr. Hans T. Clarke, professor of biochemistry, Columbia University, is chairman of the scientific committee, while Willard E. Givens, executive secretary of the National Education Association, has been elected chairman of the educational committee. Dr. Moulton is secretary. Other executive committee appointments are: Dr. Luther Gulick, professor of government, Columbia University, and director of the Institute of Public Administration; Austin H. MacCormick, commissioner of correction of the City of New York; Dr. Nolan D. C. Lewis, professor of psychiatry at Columbia University; Dr. Winfred Overholser, superintendent, Saint Elizabeth's Hospital in Washington, D. C.; Dr. A. T. Poffenberger, professor of psychology at Columbia, and Albert W. Whitney, consulting director, National Conservation Bureau.

Dr. Harry H. Moore, formerly director of the Committee on the Costs of Medical Care and public health sociologist in the United States Public Health Service, has been chosen as director of the council's activities, with headquarters in New York.

Dr. Moulton emphasized "the extreme care with which the membership of the council had been limited, during its twelve-month organization period, to outstanding scientists and educators who are acknowledged leaders in their various fields." Members of the executive committee of the American Association for the Advancement of Science are *ex-officio* members of the council, including the present president, Dr. Wesley C. Mitchell, professor of economics at Columbia University, well known as a social scientist. The closeness of the tie-up of the Research Council to the association is evidenced by the provision that all funds of the council shall be administered and disbursed by the association.

Details of a 21-page outline of the program were outlined by Dr. Bowman. They included a six-point premise, of which the highlights were as follows:

Prohibition was not successful. A large army of law enforcement officers with funds totalling many millions of dollars was not able, from 1920 to 1933, to prohibit the sale and use of alcoholic beverages. Repeal has not been successful. Excesses and abuses are evident to all. Under both prohibition and repeal, alcoholic beverages, when used unwisely, have caused inefficiency, disease and death.

At least two specific evils are recognized both by the "wets" and "drys." These are alcoholism and highway accidents due to the use of alcohol. In respect to many other aspects of the alcohol problem, there is a chaos of opinion. There is danger of hasty and unwarranted decisions in respect to the legal control of the liquor business.

The outline refers to the solution of the alcohol problem as one of the major perplexities of our civilization. It continues:

On top of all the intrinsic difficulties of the situation, there have been superimposed emotional and political elements that have produced still further complications.

It has become evident that nothing can be accomplished by the application of main force. If we are to find a way out, it can be only through the development of a complete factual basis on which can be built some effective plan of action. The main and primary objective of the Research Council on Problems of Alcohol is the development of such facts; the secondary objective is to make these facts available to the public in such a way that they will do the most good. Since the development of facts is essentially a scientific procedure, the personnel of the Council will be predominantly made up of persons who are working in the field of science. To these will be added such others from the fields of education, business and public life as will be able to assist in carrying out the secondary objective.

What does science say about abstinence and prohibition? Here are two controversial questions which make the task of any agency dealing with them an extremely difficult one. In such a situation society is fortunate if it can turn to the scientist. The scientific attack on the problem of alcohol here outlined does not imply a commitment on the part of the scientist, or of any one else, to either the present "wet" or "dry" position. The scientist believes that if an adequate body of factual data is made available and discussed fully, without heat or prejudice by men and women of intelligence, integrity and leadership, the right solution of these two questions may then be evolved. Whether truth, as revealed by science, points the way to abstinence for the individual and prohibition for society, or to moderation for the individual and to some other form of control for society, or to a modification or combination of one or more of these policies, it will be the right solution for the time and place in which we live.

Briefly summed up, the Research Council defines its field of action in the following platform:

The Council will conduct research, arrive at conclusions based on research, present the facts in suitable form to interested groups, and encourage intelligent discussion of the facts.

The Council will not arrive at conclusions based on assumptions or prejudiced opinion, engage in propa-

ganda, lobby for liquor control laws, or participate in political campaigns.

Enlarging on the above definition, the program continues:

In attacking the problem of alcohol, there are three stages—research, education and control. While present conditions are unsatisfactory to all interests, and while many persons would like to "do something" about the problem at once, science says that to proceed without a sufficient body of factual material might lead to grave mistakes.

A well-organized body of facts is needed in regard to (a) the effects of alcohol on the individual, (b) the effects of alcohol on society and (c) the effectiveness of various measures of industrial and legal control which have been attempted or which may be proposed. When the facts have been ascertained, through research, two kinds of remedial measures may then be developed—educational measures and measures of control.

Education as to the effects of alcoholic beverages on the individual and on society is approved by both wets and drys. It must be carried on among both young people and adults. With the enactment of prohibition, in most communities education about alcohol practically stopped. Propaganda—both wet and dry—took the place of education. Now education must be strictly scientific; instruction must be given without prejudice, emotion or moralizing. Law enactment and law enforcement agencies need scientific knowledge regarding all aspects of the problem. Such knowledge obviously is essential to the development of effective governmental controls.

As to measures of control, when the biological facts about alcoholic beverages are ascertained and disseminated among the people, they will then be in a better position, as individuals, to exercise self-control. When all the facts, biological and sociological, are placed before the various agencies responsible for the social control of the liquor business, society may then be more justified than it has been in the past in expecting them to develop effective industrial and legal controls.

That the results of data secured to date by previous scientific research will not be overlooked and wasted is assured by the following provision:

The Council's policy provides for the integration of the results of all studies. In outlining its program of research, the Council will take into account other adequate studies in the field which have already been conducted, which may be contemplated and which may be under way; and it will assign each of its own studies, so far as is practicable, to other research agencies, such as universities, hospitals and professional organizations. Finally, it will constantly seek to integrate the results of all studies for the purpose of resolving contradictions, of filling gaps in existing knowledge, and of making available a reasonably complete and well-organized body of factual data in a form which will assure its usefulness.

Whether the findings of the various studies are favorable or unfavorable to the use of alcoholic beverages, they will be published without prejudice.

Members of the Scientific Committee, in addition to Dr. Clarke, are:

Philip Bard, professor of physiology, the Johns Hopkins University; Walter B. Cannon, professor of physiology, Harvard University; Alan M. Chesney, dean, School of Medicine, the Johns Hopkins University; Edwin G. Conklin, professor of biology, Princeton University; Thomas R. Crowder, director, Department of Sanitation and Surgery, Pullman Company; Frederick P. Gay, professor of bacteriology, Columbia University; Frank B. Jewett, president, Bell Telephone Laboratories; Norman Joliffe, Bellevue Hospital, New York; E. K. Marshall, Jr., professor of pharmacology, the Johns Hopkins University; George B. Pegram, professor of physics, Columbia University; Charles R. Stockard, professor of anatomy, Cornell University; Edward A. Strecker, professor of psychiatry, University of Pennsylvania; Warren T. Vaughan, physician, Richmond, Virginia; C. H. Watson, medical director, American Telephone and Telegraph Company; Willis R. Whitney, vice-president in charge of research, General Electric Company.

Additional members of the Council are:

Anton J. Carlson, professor of physiology, University of Chicago; Ray Lyman Wilbur, president of Stanford University; J. McKeen Cattell, editor, The Science Press; Walter M. Dickie, director of public health, State of California; Charles H. Durfee, psychotherapist, Wakefield, Rhode Island; Vincent du Vigneaud, professor of biochemistry, Cornell University Medical College; Foster Kennedy, professor of neurology, Cornell University; Eugene Opie, professor of pathology, Cornell University; Harlow Shapley, professor of astronomy, Harvard University; Wilson G. Smillie, professor of public health, Cornell University; M. H. Soule, professor of bacteriology, University of Michigan; John Sundwall, president, American Association of School Physicians; H. E. Himwich, professor of physiology, Albany Medical College; Arthur H. Compton, professor of physics, University of Chicago; Otto P. Geier, chief medical officer, Cincinnati Milling Co.; Clarence M. Hincks, general director, National Committee for Mental Hygiene; Esmond R. Long, director, Henry Phipps Institute; R. A. Millikan, chairman, Executive Council, California Institute of Technology; Stuart Mudd, professor of bacteriology, University of Pennsylvania; Bernard Sachs, neurologist, New York; W. A. Sawyer, medical director, Eastman Kodak Company; Loyal A. Shoudy, chief medical officer, Bethlehem Steel Company; C. V. Weller, professor of pathology, University of Michigan; Reginald M. Atwater, executive secretary, American Public Health Association; George Howard Gehrmann, medical director, E. I. du Pont de Nemours Co.; McIver Woody, physician, Standard Oil Company of New Jersey; John L. Rice, commissioner of health, City of New York; Adolf Meyer, psychiatrist-in-chief, the Johns Hopkins Hospital; Howard Funk, principal, Junior High School, Bronxville, N. Y.; Fred J. Kelly, chief, Division of Higher Education, U. S. Office of Education; Daniel Prescott, professor of education, Rutgers University; Homer P. Rainey, director, American Youth Commission of the American Council on Edu-

cation; Thomas D. Wood, chairman, Joint Committee on Health Problems in Education, National Education Association and American Medical Association; Willard W. Beatty, director of education, U. S. Office of Indian Affairs, recently president, Progressive Education Association; Frank P. Graham, president, University of North Carolina; R. A. Kent, president, University of Louisville; Roy G. Ross, general secretary, International Council of Religious Education; Donald J. Cowling, president, Carleton College; F. L. Bishop, Highway Education Board; John Q. Rhodes, president, Association of Motor Vehicle Administrators; Roger William Riis, public relations counsel; W. Roy Breg, executive secretary, Allied Youth; Thomas H. MacDonald, chief, United States Bureau of Public Roads; Russel E. Singer, general manager, American Automobile Association; Samuel Thorne, attorney; Thomas D. Thacher, attorney; Percy Jackson, attorney; Harold B. Hoskins, vice-president, Cannon Mills, Inc.; Edward W. Freeman, vice-president, Suchar Process Company; Edwin C. Jameson, president, Hamilton Fire Insurance Co.; Graham Edgar, vice-president, Ethyl Gas Corporation.

SPECIAL ARTICLES

INFLUENCE OF ADRENALECTOMY ON ANTERIOR PITUITARY KETOGENESIS IN RATS

IN 1934 Long and Lukens[1] first described experiments revealing that adrenalectomy produces a marked reduction in the ketone body excretion of the depancreatized cat. Since then a number of investigators have reported that adrenalectomy similarly affects the ketonuria consequent to phlorhizin intoxication,[2] pregnancy,[3] fasting[3] and the administration of extracts of the anterior pituitary gland.[3,4] This reduction in ketonuria has been attributed to a decrease in ketone body formation consequent to the removal of the adrenal cortex. However, several other interpretations of the decrease in ketonuria are possible without having recourse to the hypothesis that the adrenal cortex, or its hormone, is essential for ketogenesis.

The observation made incidentally by MacKay and Barnes[3] that the adrenalectomized rat may develop a ketonemia after the administration of an extract of the anterior pituitary gland suggested to us that the adrenals may not be essential to the ketogenic activity of anterior pituitary extracts. For that reason, a series of studies was started to investigate more closely the blood and urinary ketone body content of normal and adrenalectomized animals treated with a crude extract of the anterior pituitary gland.

Rats were adrenalectomized forty-eight hours before the administration of a crude extract of beef anterior pituitary glands (A.P.E.), and were given normal saline "ad lib" during the interval. No attempt was made to maintain these animals for periods longer than forty-eight hours before administering A.P.E., since we did not desire the secondary effects of an adrenal insufficiency to interfere with effects attributable to the absence of the glands *per se*. All animals, normal and adrenalectomized, were fasted for seventeen hours before the injection of A.P.E. subcutaneously and of saline intraperitoneally. Following the injections, the urine was collected for eight hours and its ketone body content determined by the method of Van Slyke and Fitz. At the end of the eight-hour period, the animals were bled from the aorta and the blood ketone body content was determined by the same method.

Our data, summarized in Table I, indicate that in the absence of the adrenal glands, A.P.E. administration is relatively ineffective in producing a ketonuria; an observation which is in accord with that of others. However, the blood ketone body content indicates no apparent disturbance in the ability of adrenalectomized rats to manufacture these substances. In fact, if anything, the blood ketone content of the adrenalectomized rats is greater than that of the normal animals. That of the adrenalectomized rats is 5.7 mgm per cent. higher than that of the normal group, the ratio of the difference of the means to the standard error of this difference being 2.53.

TABLE I

Experimental group	No. of rats	Average weight gms.	Fasted hours	Blood ketones* 8 hours after A.P.E. mgm per cent.	Urine ketones* 8 hours after A.P.E. mgm per 100 gm
Normal	20	191	17	18.2	5.9
Adrenalectomized .	17	163	17	23.9	0.9

* Expressed as acetone.

One possible explanation of these data is that presented by MacKay and Barnes,[5] who postulated that adrenalectomy results in an increased ketolysis, which in turn is responsible for the decrease in ketonuria. However, the fact that the blood ketone content is at least as great in our adrenalectomized animals as it is in the normal group makes it obvious that irrespective of whether ketolysis is or is not increased, the same

[1] C. N. H. Long and F. D. W. Lukens, SCIENCE, 79: 569, 1934.

[2] G. Evans, *Am. Jour. Physiol.*, 114: 297, 1936.

[3] E. M. MacKay and R. H. Barnes, *Am. Jour. Physiol.*, 118: 184, 1937.

[4] E. G. Fry, *Endocrinology*, 21: 283, 1937.

[5] E. M. MacKay and R. H. Barnes, *Am. Jour. Physiol.*, 122: 101, 1938.