electrical industry's debt to scientific research. In the afternoon of the same day, he spoke before the weekly colloquium of the Research Laboratory at Schenectady on "Some Professional Experiences."

PROFESSOR AUGUSTE PICCARD, of the University of Brussels, gave a Norman Wait Harris lecture at Northwestern University on February 15 on "Exploring in the Stratosphere."

SIR WILLIAM B. HARDY, director of food investigation, department of scientific and industrial research, gave the Trueman Wood Memorial Lecture before the Royal Society of Arts on February 22, on "Industrial Research with Biological Material."

AT the fifteenth annual meeting of Edison Pioneers on February 11, the formation of an International Edison Foundation was announced. The foundation, which has not yet been incorporated, plans to provide fellowships in physics and chemistry in universities of the United States and other countries. American graduate students will be sent abroad and foreign students will be brought to the United States to continue their education in physics and chemistry. Dr. Arthur E. Kennelly, professor emeritus of electrical engineering at Harvard University and the Massachusetts Institute of Technology, is chairman of a committee of three appointed to confer on the fellowships.

RECENT action of the Rockefeller Foundation has approved a grant for two years, ending July 1, 1934, for a sum not to exceed $20,000 to supplement the funds of the Ohio Wesleyan University for the maintenance of the scientific program of the Perkins Observatory.

A GIFT of £500 from the Rockefeller Foundation has been made to the Molteno Institute of Parasitology of the University of Cambridge, for the purchase of instruments and for assistance in connection with investigations carried on by Professor Keilin.

ACCORDING to the *Journal* of the American Medical Association the Thomas W. Salmon Memorial Committee of the New York Academy of Medicine announces that small grants are available to physicians and others who are engaged in research work in the field of psychiatry, mental hygiene and child guidance. Workers who are interested in receiving such grants may apply to the committee, 2 East One Hundred and Third Street, New York.

DISCUSSION

IS IT "FAIR TO SAY THAT HOOKWORM DISEASE HAS ALMOST DISAPPEARED FROM THE UNITED STATES?"

I. INTRODUCTION

SINCE 1930 I have motored about 10,000 miles through the Gulf-Atlantic states, chiefly in the sandland districts. These trips have given an opportunity to compare present conditions with those of the earlier years of the century and to converse with people of all walks of life.

A striking point in these conversations has been the number of persons who believe that hookworm disease has been eradicated from this country and who cite as authority newspaper reports allegedly based on statements attributed to the Rockefeller Foundation.

The Thirteenth Annual Report (1927—for 1926) of the International Health Board of the Rockefeller Foundation contains in fact (pp. 5–6) the following paragraph:

> The diseases that the Board has chosen for special attention have been world-wide in their distribution and of great economic importance. Field research in the epidemiology of hookworm disease has *advanced knowledge* concerning the life history of the hookworm, both in its free-living larval form and in its adult relationship to the host, so that we now have a much better understanding of the disease. This knowledge has enabled *governmental agencies* to *delimit* the field of control work and to modify the methods of treatment and of prevention to such an extent that the former *administrative methods of control have been revolutionized. The results have been extraordinarily successful.* At the present time *it is fair to say that hookworm disease has almost disappeared from the United States* and is rapidly coming under control in many parts of the world. But the *great achievement* is not the social and economic rehabilitation of the more than six or seven million people who have been treated for the disease during the past ten or fifteen years; it is the development of administrative measures that will prevent millions yet unborn from ever suffering from its ravages. (Original not in italics).

Until recently I had no idea that so many people had taken the Foundation's report seriously, but during these recent trips I had to combat it so frequently that I wrote to Mr. Rockefeller, Jr., placed before him evidence as to the wide distribution of the disease in the Southern states, offered to motor with a representative of his selection in order to collect additional data for him, and urged him to take steps to modify the claim published by the Foundation. My letters were referred to the directors of the International Health Division, but up to date no retraction or modification has come to my attention.

II. ANALYSIS OF THE FOUNDATION'S CLAIM

The three essential points in the claim are:

(1) *Important discoveries in the biology of hook-*

worm: On pp. 62–72 are cited observations (regarding: 1 temperature, 2 moisture, 3 soil, 4 fermentation, 5 water in bulk, 6 salt) in connection with which the thought arises whether these are the points of "advanced knowledge"; at least, these are presented in a way that the reader (if not familiar with the literature on the subject) might easily conclude that they are new discoveries.

All six are repetitions (in new localities) of observations made 25 to 40 or more years ago.

(2) *Revolutionized administrative procedures in control:* On pp. 62–72 of the report are cited four control measures (1 shoes, 2 sanitation, 3 education, 4 treatment), but by no stretch of the imagination can these be called new. According to p. 62 of the report the egg-count method "has revolutionized administrative methods of control of the disease."

Accepting this as the basis of the "great achievement" mentioned on p. 6, the point may be raised that only two Southern states (Alabama and Tennessee) have published surveys based on this technique while officials of the Boards of Health of five Southern states have informed me that they do not use the egg-count method.

The word "delimit" (p. 6) together with the discussion (pp. 62–72) seems to indicate that the so-called "Alabama Plan" is part of the revolutionized method of control. The "Alabama Plan" was indeed revolutionary but it was short lived. It was tried out in a few counties and was promptly abandoned.

A practical question arises, namely: What "governmental agencies" applied these "extraordinarily successful" administrative methods in counties which have no health unit? Only county, state, and national health agencies come into consideration. Of the sixty-seven counties in a certain Southern State, only four have full-time units; neither the State Board of Health nor the U. S. Public Health Service applied revolutionary methods in the sixty-three other counties. It is estimated that less than five per cent. of the rural population of this particular state has whole-time local health service; who served the other ninety-five per cent.? Surely neither part-time health officers nor county physicians could accomplish the "great achievement" claimed by the Foundation.

(3) *"It is fair to say that hookworm disease has almost disappeared from the United States."* Rather definite information is available which, unfortunately and to my profound regret, does not square with this enthusiastic claim. See III.

III. Hookworm Disease in the Gulf-Atlantic States

In a recent publication (1932) I have summarized the hookworm situation as follows.

(1) The extreme case known as the "dirt eater" is much more rare now than from 1902 to 1910. (I have seen less than fifty in the past two years.)

(2) In general, the cases are much lighter than when the work first began in 1902.

(3) The disease has been reduced both in intensity and somewhat in extent, but

(4) The job has not been completed.

The fundamental problem in hookworm control is not a question of bookkeeping or microscopic examinations, but requires a change in the daily habits of hundreds of thousands of rural whites, Indians, and negroes.

In studying the prevalence and importance of hookworm disease three methods are used according to circumstances and the individual preference of the workers:

(1) *Diagnostic microscopic examinations:* Through courtesy of the State Boards of Health I was able to summarize the results of 121,388 recent (1929) examinations in Alabama, Arkansas, Florida, Georgia, Kentucky, Mississippi, Tennessee, Virginia, and West Virginia; 34,131 of the specimens (or 28.1 per cent.) were "positive."

(2) *Egg-counts:* Otto and Cort,[2] two leading apostles of the egg-count technique, have summarized evidence gathered (in Virginia, Tennessee, Kentucky, Florida, and Alabama) by themselves and "by several members of the International Health Division" and they conclude that hookworm disease has not almost disappeared from this country.

Havens,[3] of the Alabama State Board of Health (and an apostle of the egg-count method), says that "in the southern counties of Alabama—hookworm control—still is a major public health problem."

(3) *Symptomatic inspection:* During a motor trip of 5,524 miles[4] with one assistant I examined 18,649 white children in 98 graded schools, using the method of rapid symptomatic inspection (in which my personal theoretical error is about 17 per cent. as checked by the "smear method"); 6,063 of these children (or 32.5 per cent.) showed symptoms in harmony with hookworm disease; deducting 20 per cent. as theoretical error, the corrected estimate is 26 per cent.

In five rural schools in one county, I have more recently examined 429 white pupils, 266 (or 62 per cent.) of whom showed symptoms in harmony with hookworm disease; deducting 20 per cent. as theoretical error, the corrected estimate is 49.6 per cent.

IV. Summary

In view of the foregoing (and other) data I am constrained to take issue with the hookworm experts

[1] Public Health Reports, Aug. 1, 1930.
[2] *Jour. Amer. Med. Assn.*, July 11, 1931.
[3] *J. Med. Assn. Alabama*, Jan., 1933.
[4] *Southern Med. Journ.*, 1932, 189–192.

of 61 Broadway, and to submit that their claim is not "fair," in fact, it has done harm in certain localities.

V. CONCLUSION

Not only a scientific but also a great moral and humanitarian issue is involved. It is to be regretted that the Rockefeller Foundation has not complied with a duty it owes to the rural children of the South, to the scientific world, to itself and to Mr. Rockefeller (Senior and Junior), frankly and publicly to modify its *ex cathedra* claim in harmony with facts.

Economics, education, welfare, health and even human life are involved.

CH. WARDELL STILES

WINTER PARK, FLORIDA

CAN A PUBLICATION BE CAMOUFLAGED?

THE persistence of the faith that in some mysterious manner material may be distributed to the public without being published, by the mere device of mimeographing instead of printing, was again illustrated at the Atlantic City meeting. In at least two societies during discussions of the still vexed question of publishing abstracts, "mimeographed" as a substitute for "printed" abstracts were urged on the alleged grounds that "publication" would thus be avoided.

In his discussion "What is a Publication?"[1] Storer points out that the method used in reproduction has no bearing on the question of publication. He cites among other examples the experience of the Biological Survey with *Bird Banding Notes,* a mimeographed publication which when it was initiated bore a note on the first page of each issue—"Bird Banding Notes is not a publication and is not for general distribution." In spite of this, however, the scientific value of the contained matter soon became evident and the material was cited by other investigators. I am further informed by the Biological Survey that *Bird Banding Notes* is now being sent regularly to *Biological Abstracts* at the request of the editor of that review journal.

The *Plant Disease Reporter* is a case in point. This mimeographed serial was established in 1917, as a means of making readily available to working pathologists incidental information thought to be of transient rather than of permanent interest and which should be placed in their hands more quickly than was possible through any available printed medium. The result was a collection of mimeographed notes, the popularity of which was immediately attested by the material presented as well as by the demands for the *Bulletin,* as it was then called. In 1923, to still further emphasize the informal nature of the series, the name was changed to *Reporter.* In spite of this, the actual scientific value of the material included has been abundantly attested by its repeated citation in regularly printed scientific literature and by numerous reviews of its contents in the *Review of Applied Mycology* everywhere recognized as the standard review journal for mycological and plant pathological literature.

It is obviously possible for a group of workers in a limited field, for example, taxonomists, to bind themselves not to recognize species published by a particular method or for that matter in a special group of languages or in a particular color of ink. But general scientific matter disseminated in any form available for more or less permanent record is certainly scientifically published, whatever the method of duplicating employed.

NEIL E. STEVENS

BUREAU OF PLANT INDUSTRY
WASHINGTON, D. C.

[1] SCIENCE, n. s., 75: 486–487, 1932.

THE AGE OF METEOR CRATER

IN SCIENCE,[1] Professor Blackwelder proposes that the Coon Butte crater in Arizona is of the Post-Tahoe epoch, some forty to seventy-five thousand years old. This decision is supported primarily by the evidence of the lake bed in the crater proper. However, in connection with the lake-bed a statement is made that I feel needs some correction. On page 559, Dr. Blackwelder states concerning a layer of rhyolitic ash in the lake bed: "The bed of volcanic ash is plainly the record of an explosive eruption somewhere in the south-western arid region. *No such eruption is known to have occurred since Pleistocene (late glacial) times.* If the age of this shower is ever determined it may afford important evidence regarding the age of Meteor Crater." (The italics are mine). It happens that the date of the shower mentioned is probably known accurately. At a meeting of anthropologists in Santa Fé during September, 1931, the Arizona University party reported the discovery of pit houses filled with ash, not too distant from the Meteor Crater. Wood was recovered from these and has been dated by Dr. Douglass, using his tree-ring calender. It had been buried by an eruption that took place in the neighborhood of 793 A. D. If the two showers are identical, then Barringer's dating of 2,000 to 3,000 years ago is probably the most acceptable of all.

Much supporting evidence for the inter-glacial dating is drawn from the formation and degradation of the talus slopes. I feel strongly that we can not draw analogies from the formation of talus where the only agents are those normal to a moist and colder climate. There is no doubt in my mind that the talus slopes were built up by the impact and explosion and not by the usual forces that disintegrate cliff faces.

[1] Vol. 76: No. 1981, pp. 557–560, December 16, 1932.