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AGRICULTURAL RESEARCH IN THE WAR AND AFTER[1]

By Dr. E. C. AUCHTER

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RESEARCH workers in our State agricultural experiment stations, in the Federal Department of Agriculture, in universities and other research and educational institutions and in industry have faced a tremendous challenge during this war. That they are meeting it successfully is witnessed by the result—an unprecedented agricultural production, the development and utilization of new foods, drugs, fibers and strategic materials of many kinds; improved methods of distribution, packaging and processing of agricultural products; and increased knowledge of requirements for foods and other products needed in everyday living. These results have been made possible by utilizing the materials and knowledge accumulated through scientific research, as well as by effective organization for developing new knowledge to meet emergency needs. Scientists in all fields related to agriculture are playing an important part in this work and will play an even more impotant one in the future. Just as great a challenge awaits research in the post-war world as it faces now. By continuing to work together we shall be able to meet it.

But an overwhelming number of demands tumble upon each of us these days. In the complexity of details it is both difficult and important to keep the major problems clear and if possible see the general direction in which we are moving. So the question I wish to propound this morning is: What is the real value of the agricultural and related research work being carried on year after year in the form of thousands of big and little projects? We know that it is helpful to solve a lot of individual problems—but what do such solutions contribute as a whole for this nation and for mankind?

This question can be divided into three parts: What has agricultural research done in the past? What is it doing now? What can it do in the future?

[1] Address given at the fifty-seventh annual convention of the Association of Land-Grant Colleges and Universities, Chicago, Ill., October 27, 1943.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A NEW CONTACT LENS FOR VIEWING THE ANGLE OF THE ANTERIOR CHAMBER OF THE EYE

The angle of the anterior chamber of the eye is hidden by opaque tissues and by total internal reflection at the outer surface of the cornea. It is possible to examine the chamber angle by use of a contact lens which eliminates internal reflection and creates a visual angle which passes behind the limbus.

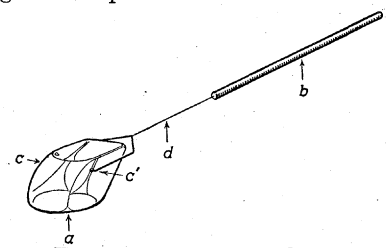

Fig. 1. A new contact lens.

A new instrument is introduced as an improvement over lenses now in use. As illustrated in Fig. 1, it consists of a new type of contact lens *a* and a handle *b* which are connected by a forked spring wire *d* pivoted at *c* and *c′*. This flexible spring wire permits the lens to be held in position without damage to the surface of the cornea. The lens is made of E. I. du Pont's plastic, H. C. 208 or of lucite, the former being preferable, since it does not scratch as easily, takes a finer optical surface and may be sterilized in boiling water. The quality of its internal reflection is excellent. Glass might be used but is heavier and more fragile than the plastics.

The concave contact surface, A (Fig. 2), of the lens has a diameter of 10 mm and a radius of curvature of 7.86 mm. Since the outer surface of the average cornea has a radius of curvature of 7.84 mm, a capillary film of tears forms between the lens and cornea when the two are in apposition (a drop of normal saline or other suitable solution may be used to wet the contacting surface of the lens before application). This film creates optical continuity between the contact lens and cornea and also serves to hold them together.

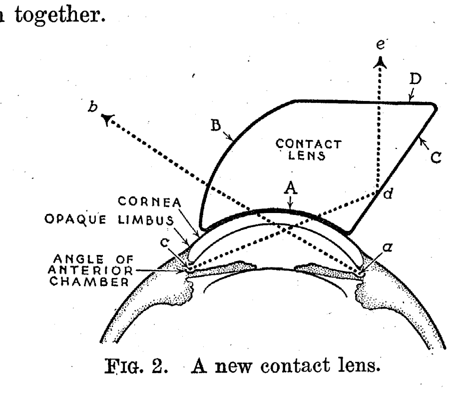

Fig. 2. A new contact lens.

When the lens is on the cornea (Fig. 2), a ray of light from a point *a* in the chamber angle is not reflected internally as before, but continues with little refraction to *b*. Refracting surface, B, which may be molded or ground with any desired magnifying power, is used with the loupe or unaided eye. On the opposite side of the lens, plane surfaces, C and D, form a reflecting prism. Reflecting surface, C, is not silvered; instead, total internal reflecting properties of glass or plastic are utilized. A ray of light from *c* is reflected at *d* to the observer at *e*. This prism is designed for use in combination with a standard slit lamp biomicroscope. The prism may be rotated on the cornea, and emerging rays, at any point in rotation, are directed toward the binoculars.

All other contact lenses used for this purpose depend upon the lids and sclera for support and include a deep liquid chamber between the lens and outer surface of the cornea. The lids frequently displace the lens, permitting air, which destroys optical continuity, to enter the liquid chamber. Furthermore, pressure of the lids, through the lens contact on the sclera, may create distortion of the tissues. For these reasons, only a few groups of workers have used gonioscopy routinely.

These objectionable features are not present in the new instrument; therefore, it is more practical for general clinical use.

Variations in lens surfaces and prism combinations are possible when the principles of the capillary film and the flexible supporting unit are used. Experiments with such variations are proposed and may be reported in the future.

Lee Allen

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BOOKS RECEIVED

Cushing, Harvey. *A Bio-Bibliography of Andreas Vesalius.* Illustrated. Pp. xxxviii + 229. Schuman's. $15.00.

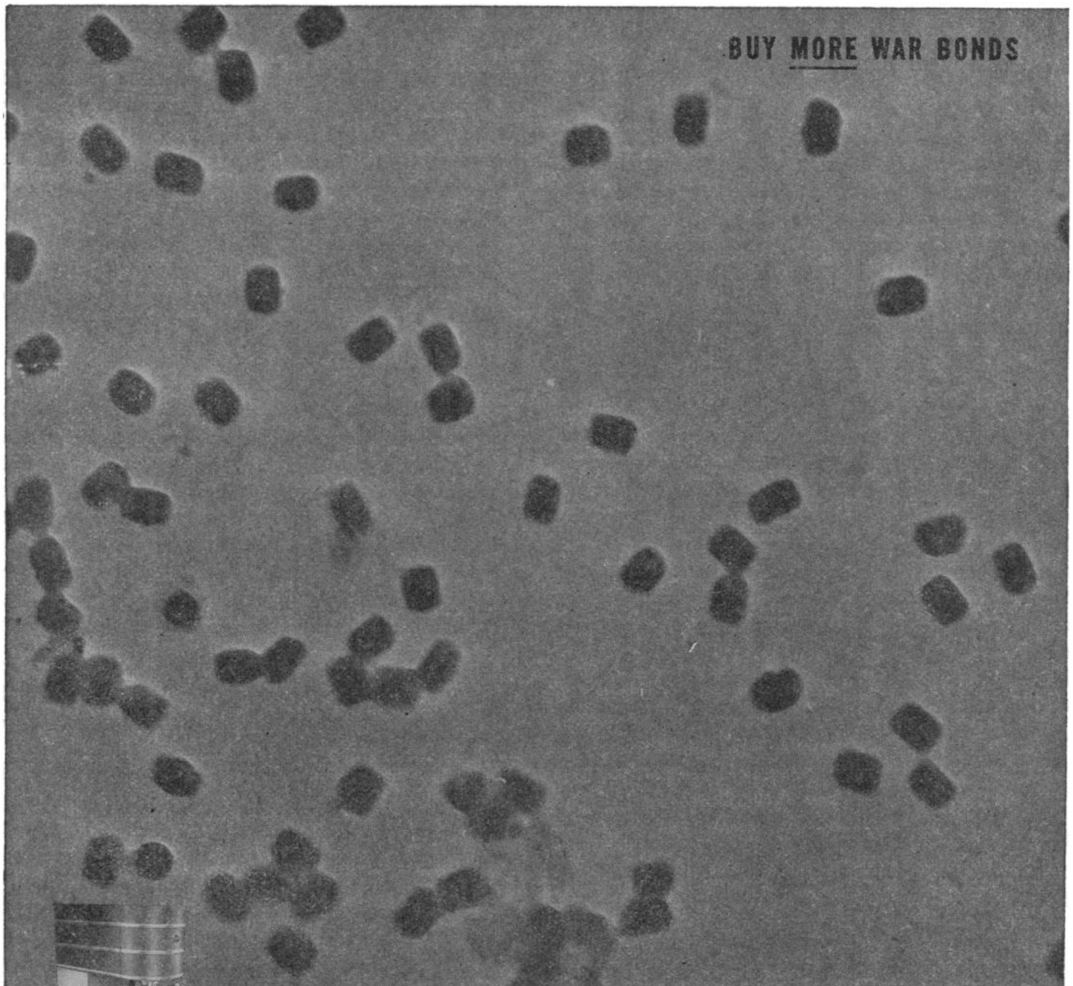
Hewson, E. Wendell and Richmond W. Longley. *Meteorology Theoretical and Applied.* Illustrated. Pp. xii + 468. John Wiley and Sons. $4.75.

Table of the Bessel Functions $J_0(Z)$ and $J_1(Z)$ for Complex Arguments. Prepared by the Mathematical Tables Project Work Projects Administration of the Federal Works Agency. Illustrated. Pp. xliv + 403. Columbia University Press. $5.00.

Table of Circular and Hyperbolic Tangents and Cotangents for Radian Arguments. Prepared by the Mathematical Tables Project Work Projects Administration of the Federal Works Agency. Illustrated. Pp. xxxviii + 410. Columbia University Press. $5.00.

Table of Reciprocals of the Integers from 100,000 through 200,009. Prepared by the Mathematical Tables Project Work Projects Administration of the Federal Works Agency. Pp. viii + 201. Columbia University Press. $4.00.

The Harvey Cushing Collection of Books and Manuscripts. Pp. xvi + 207. Schuman's. $8.50.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