large amounts, probably due to neutralization of gastric contents; we have, however, obtained very good results with one per cent. of precipitated calcium phosphate or 1.5 per cent. of bone ash, but our experience with these, in view of the good results obtained with the ration as outlined, are not sufficiently extensive to warrant the change when milk is fed. In the third place, the protein content could probably be advantageously increased.

As milk is available in sufficient quantities at all times in the writer's laboratory, no extensive or prolonged experience with a milk-free ration comparable in efficiency to a milk-containing ration can be drawn upon. When available, fresh whole milk produced by cows on a non-varying ration should be used as a constant ingredient of the stock colony ration, as it serves to cover most effiicently not only known requirements, but no doubt many requirements not as yet appreciated. The factor of proper nutritive condition of the young rats before being started on their various dietary regimens is a factor which enters into the results of all experiments and therefore is worthy of far greater attention than it is given in most laboratories.

H. STEENBOCK
LABORATORY OF AGRICULTURAL CHEMISTRY,
UNIVERSITY OF WISCONSIN

ALKALOIDAL CONTENT OF DATURAS AFFECTED BY MOSAIC INJURY

PLANTS of *Datura Stramonium* grown in the drug garden maintained by the Department of Pharmacognosy of Western Reserve University during the season of 1922 were severely injured by mosaic. The injury affected both green-stemmed and purple-stemmed plants, both being, apparently, equally susceptible. The symptoms of the disease appeared during the height of the growing season, being manifested in the developing leaves, which remained small, and became mottled and distorted. The width of the affected leaves was much reduced, while the tips and the extremities of the dentations were more nearly of normal length, giving the leaves the characteristic stringy appearance not uncommon in mosaic troubles. The plants as a whole were below normal in development.

As the drug value of these Daturas, both of which are official as "Stramonium" in the United States Pharmacopoeia, is believed to depend on their alkaloidal content, alkaloidal analyses were made of both diseased leaves and leaves from plants which showed no mosaic. Leaves taken for analyses were hand-picked from closely adjoining plants at the same time. The petioles were removed. The leaves were dried simultaneously, as rapidly as possible, on the same shelf of a hot-air oven at a temperature not over 100°. Analyses were made by the official method of the United States Pharmacopoeia IX. The results are tabulated below.

TABLE I

					Per cent. alkaloids	Average
Purple-stemmed	plants,	mosaic,	Sample	1...	0.27	
"	"	"	"	2...	0.28	0.275
"	"	normal	"	1...	0.147	
"	"	"	"	2...	0.138	0.142
Green-stemmed	plants,	mosaic,	Sample	1...	0.27	
"	"	"	"	2...	0.303	0.285
"	"	normal	"	1...	0.072	
"	"	"	"	2...	0.072	0.072

It will be noted that the figures for mosaic plants of both varieties are slightly above the official alkaloidal requirements (0.25 per cent.) for Stramonium as a drug, and, by themselves, are therefore by no means remarkable. The notably low results of the normal leaves may be considered as rather unusual, especially in the case of the green-stemmed plants, inasmuch as both varieties appear rarely to fall below the pharmacopoeial requirement. The locality of growth was considerably shaded. Schneider[1] has observed that plants of the closely related *Atropa belladonna* show a markedly higher alkaloidal yield when grown in full sun. Inasmuch as the Daturas are normally sun-loving plants, it appears not improbable that the factor of insolation may have been involved. As the mosaic plants were subjected to the same conditions, this factor can not be held responsible for the marked disparity in content between normal and mosaic leaves. Sievers[2] has shown a marked increase of alkaloidal content following prevention of flowering in the Daturas; while flowering was by no means inhibited in these mosaic plants, it was apparently hindered to some extent by the distortion of the flowering-tops. In Sievers's experiments, however, inhibition of flowering increased the size of leaves—the converse of the effect of mosaic. The same author[3] has also shown an increased concentration of the alkaloidal content of belladonna in the tender growing parts, which, in the Daturas, are most affected by mosaic. It is evident, of course, that a given weight of mosaic material represents a considerably greater number of leaves than the same weight of normal leaves.

[1] Schneider, Albert, "The cultivation of belladonna in California," Bulletin 275, Agricultural Experiment Station, Berkeley, Cal., 1916.

[2] Sievers, A. F., "The influence of inhibiting flowering on the formation of alkaloids in the Daturas," *Jour.* of the American Pharmaceutical Association, Vol. X, No. 9, pp. 674–676, 1921.

[3] Sievers, A. F., "The distribution of alkaloids in the belladonna plant," *Am. Journ. Pharm.*, Vol. 86, No. 3, p. 97, 1914.

It is planned to continue the observation of the symptoms and effects of mosaics on the Daturas, with special reference to alkaloidal yield. Inasmuch as a somewhat similar disease has been noted here on *Hyoscyamus niger,* this species also will be subjected to similar investigations if the disease reappears.

E. E. STANFORD
E. D. DAVY
WESTERN RESERVE UNIVERSITY

THE OPTICAL SOCIETY OF AMERICA

THE eighth annual meeting of the Optical Society of America, Dr. L. T. Troland, president, was held at Cleveland, Ohio, Thursday, Friday and Saturday, October 25–27, 1923. Hotel headquarters were at the Hotel Cleveland. All sessions for the reading of papers were held in the Physics Building, Case School of Applied Science.

The meeting was held under the auspices of the following local committee in Cleveland:

Representing the National Lamp Works: Dr. W. E. Forsythe, *chairman;* Mr. L. C. Kent, Mr. C. D. Spencer, Mr. M. Luckiesh, Mr. A. H. Taylor, Dr. A. G. Worthing.

Representing Case School of Applied Science: Professor D. C. Miller.

Representing Western Reserve University: Professor H. W. Mountcastle.

Representing Warner and Swasey: Mr. Warner Seely.

In concluding its sessions the society tendered a most hearty vote of thanks to this committee as well as to the National Lamp Works, Case School of Applied Science, Western Reserve University, Warner and Swasey and the Cleveland Museum of Art for their efforts which resulted in a meeting generally admitted to be the most notable and successful in the history of the society.

About 50 persons attending the convention registered and obtained rooms at the Hotel Cleveland. The *registered* attendance at Case School was 78, of which 57 were from outside of Cleveland. The *actual* attendance was undoubtedly much greater than this. The number present at the sessions varied from about 50 to over 250.

SPECIAL FEATURES OF THE MEETING

The address of the retiring president, Dr. L. T. Troland, October 26, was on "The optics of the nervous system."

Other notable features of the meeting deserve special mention.

(1) Professor A. A. Michelson's paper on "The limit of accuracy in optical measurement" contributed by invitation on October 26: In introducing Professor Michelson, Professor D. C. Miller of Case School recalled in a very happy manner Professor Michelson's early connection with the department of physics at Case, mentioning his work on the velocity of light, the interferometer and the renowned experiment on "ether drift." He also exhibited as mementos of this early work parts of Professor Michelson's original apparatus. Before proceeding with his paper, Professor Michelson also recounted a number of interesting reminiscences of his first measurements of the velocity of light and the development of the interferometer. Over 250 persons heard Professor Michelson speak.

(2) Papers contributed by invitation by Professor E. L. Nichols as follows on October 26: "The spectral structure of the kathodoluminescence of metals in solid solution," by T. Tanaka; "On the spectra of incandescent oxides," by E. L. Nichols and L. J. Boardman.

(3) Visits to the Cleveland Museum of Art: The Cleveland Museum of Art is located in Wade Park only a short distance from Case School. On October 25, the director of the museum, Mr. Frederic Allen Whiting, addressed the meeting by invitation, and explained the work of the museum in a most interesting manner, dwelling particularly on "The optical problems of an art museum." He extended to all members and guests of the society a most cordial invitation to visit the museum. Many availed themselves of this opportunity to visit a museum which is notable and exceptional in many respects, and these visits contributed greatly to the pleasure and profit of attendance at the meeting.

(4) Visit to Nela Park: On the afternoon and evening of October 25th, members of the society were guests of the National Lamp Works at Nela Park. Parties were conducted through the Research Laboratories, the Laboratory of Applied Science and lamp factories and were given exceptional opportunities to observe the actual manufacture of lamp bulbs and lamps. In the evening a complimentary dinner given to the society by the National Lamp Works was followed by a symposium on light and lighting by Professor E. F. Nichols, Mr. Ward Harrison and Mr. M. Luckiesh and a beautiful experimental demonstration of the projection of mobile color patterns by Messrs. M. Luckiesh and A. H. Taylor, of the Nela Laboratory of Applied Science.

(5) Visit to Warner and Swasey: On October 27, the society visited the plant of Warner and Swasey, which is renowned for the construction of the largest astronomical telescope mountings in the world. Members were personally greeted by Mr. Swasey, who showed many objects of interest in his office. The mounting for the giant reflector which is just being completed for the Ohio Wesleyan University was on