

OUR NEW FALL LINE

is full of good things, and it will be to the financial advantage of every retail dealer to inspect it in its entirety. It is in our establishment that the wide-awake jeweler finds everything sold over his counters at prices that are always as low as it is possible to quote on reputable merchandise. He will also find our stock is more extensive, complete and comprehensive than ever before.

You, of course, contemplate visiting the market this month or next, and will take advantage of the reduced railroad rates to Chicago on account of the National Encampment of the Grand Army of the Republic, which convenes here August 25th to September 1st, and the Merchants' and Travelers' Association excursions during August and September, for you know there is an apparent advantage to every buyer in selecting his goods where assortments are complete.

For this reason and others we believe it is decidedly to your interest to call and see our stock when in the city. You will find a cordial welcome awaiting you at our establishment, and we extend you a hearty invitation to make our store your headquarters during your stay in Chicago.

OTTO YOUNG & Co.

WHOLESALE JEWELERS AND OPTICIANS

139 to 143 State St.

CHICAGO

Philadelphia Notes.

Philadelphia has just passed through the hottest July in a score of years, which intensified the usual midsummer lull in business. The thermometer favored the nineties the greater part of the month, and all who could conveniently escape from the city fled to mountains or seashores. Those who remained from choice or necessity could do little shopping under the circumstances, and business languished accordingly. Prospects are excellent, however, and preparations are governed by expectations of a brisk fall trade.

The Trades League has again this summer succeeded in influencing the Pennsylvania and Reading Railroads to grant special rates to the seashore in persons in the extensive section of country tributary to Philadelphia, with stop-over tickets in this city, going and coming. Experience of former years has shown that business men avail themselves of these opportunities to replenish their stocks, and their ladies come prepared to shop. The Trades League and the railroad companies have together worked up a business which has been mutually profitable, and the increasing popularity of these trips of pleasure and business combined is relieving the midsummer dullness of trade. On July 26th no less than five big excursion trains brought crowds of such visitors to the seashore, and most of them will take advantage of the opportunity to transact business in this city.

Edgar Brown, of McIntire, Magee & Brown, manufacturing and wholesale opticians, treated himself to a well-earned two-weeks' vacation last month. Mr. McIntire has also been recreating. June stock-taking revealed a most satisfactory half-year's business.

L. P. White and Wm. G. Earle returned last month from their trip to the Paris Exposition.

Bailey, Banks & Biddle Co. was awarded the contract for the design and manufacture of the beautiful silver trophy for the chess tournament between the Pennsylvania, Cornell and Brown Universities.

Harry A. Schimpf, of H. Muhr's Sons, 1110 Chestnut Street, died at his home on Diamond Street last month after an illness of two years. The deceased was forty-four years old and one of the popular members of the local trade. He entered the employ of Muhr's thirty years ago and steadily advanced himself until he was finally admitted to a partnership. But ill health interrupted his career. Over a year ago he went to Europe and took treatment at the famous German watering places, but all to no purpose. He was formerly one of the directors of the Jewelers' Club, and one of its most popular members.

Joseph Ferguson, optician, in the Harrison Building, Fifteenth and Market Streets, has enlarged and improved his store, and added greatly to his stock.

Jeweler J. Frank Aller, Dover, Del., who is well-known in this city, has been appointed chairman of the Delaware State Republican Executive Committee.

James H. Kelly, of the watch department of Bailey, Banks & Biddle Co., returned last month from a trip abroad.

Daniel E. Weston, optician, is now located in new quarters at 1707 Chestnut Street, which are handsomely equipped and furnished.

F. W. Schuler, principal of the Philadelphia College of Horology, recently arrived home from a trip to the West, during which he visited many interesting points. Mr. Schuler is recognized as one of the best teachers of practical horology in the country, and his interest in his school inspired his trip to the West. Everywhere he was graciously welcomed, and established many pleasant acquaintanceships.

A. Jay Cross, of New York, recently visited this city and delivered a lecture at the Continental Hotel, in the course of which he explained to a number of opticians present his instrument for eye examination, the retinoscope.

Abie Sickles, of M. Sickles & Sons, returned last month from a ten-weeks' trip in Europe. He combined pleasure with business and spent some time at the Exposition.

Hales & Wallace, opticians, at 131 South Tenth Street, had a window display recently which attracted much attention. It consisted of rare and valuable relics of the past. Thomas Slater, with D. V. Brown, manufacturing and wholesale optician, spent his vacation last month at Holly Beach.

Railroad Employees Selling Watches.

WAXMANTON, IND., July 9, 1900.

EN. KEYSTONE.—If you will kindly print the following in your valuable paper I think it will be read with interest by many jewelers who are annoyed, just as I have been, by express agents selling watches and jewelry. The agent of the Big Four here came into possession of a catalogue of a jobbing house and began talking up watches, chains, jewelry and fountain pens. Finally, he began running down my goods. He sold two watches and some jewelry. My friends came to me with all the particulars. As I was formerly a telegraphist and railway agent I knew the railway companies did not allow their agents to sell merchandise if they knew of it. I thought this fellow had gone far enough, so I reported him to the superintendent of the road. He sent a man to investigate the matter at once. The result was he came so near losing his job that he will not take an order any more for anything. The jobbing house reports that they never had his name on their books. Possibly not, but he got the goods from them just the same. If the jewelers will watch the railroad agents in the small towns they will find that many of them are doing something in this line. I hope my brother jewelers will look out for all these fellows and bring them up with a round turn. And don't forget to remember the jobber, or so-called firm, who sells to such fellows. My brothers, if we don't protect our own business we can't expect any one else to. Respectfully yours, EUGENE WILSON.

New Goods and Inventions.

[The illustration and description of new goods and inventions is a permanent feature of THE KEYSTONE, our twofold object being to keep the merchant jeweler thoroughly posted on the very latest and most valuable goods, and the practical jeweler equally well posted on the newest inventions and improvements in tools and appliances used in the bench. For the benefit of the optician, we also illustrate and describe new optical goods and instruments in the department.]

The Golf Spoon.

A pretty and seasonable novelty is a golf spoon. All the country is interested in golf, and of course an appropriate spoon is in order, for favors, prizes or souvenirs. At



most of the resorts golf is the principal attraction, and, consequently, this spoon will be in demand as a souvenir. The die-work and finish are very fine, and when engraved with a view of the club house or hotel, are irresistible. The spoon is made by Coddling & Heilborn Co., of North Attleboro, Mass., and is supplied in tea and coffee sizes.

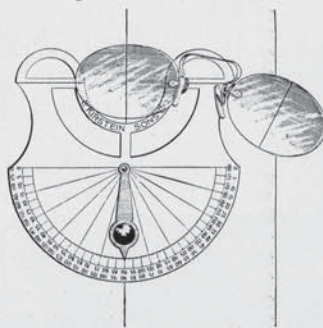
Two Valuable New Tools.



This illustration shows a new ring cutter, and as there has been heretofore practically no really effective tool for this purpose, this new device will be much appreciated by workmen. It is operated by slipping the finger guard under the ring, which can always be easily done. Then, by holding the tool in the left hand and turning the crank to the right, it will cut any ring in a few seconds, leaving the ends in proper condition to solder. A spring under the finger guard affords sufficient power to feed the saw. The cutter is made by Kendrick & Davis, Lebanon, New Hampshire. Another valuable new tool made by this firm is an optician's screw driver with interchangeable blades and new style handle, enabling the person using it to get as near as possible to his work.

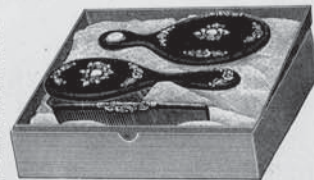
For Finding the Axis of a Lens.

Another useful addition to optical devices is the little instrument, here illustrated, for finding the axis of a lens. To find the axis, place the lens horizontally on the axis finder, and, looking through the lens at a perfectly vertical line, rotate both lens and axis finder until the line appears continuously through the lines. At this the needle will point out the axis. The whole operation is but the work of a moment, and the correctness of the result may be relied on. The little instrument is made by E. Kirstein Sons Co., Rochester, N. Y., and its efficacy and convenience are said to be highly commended by the opticians who have used it.



Ebonoid Ware.

Our illustration shows a specimen of the handsome ebonoid goods which the trade are finding so popular and salable. Ebonoid is said to be capable of a finer finish than ebony. It is also claimed for it that it will not crack or split, and that heat or moisture do not affect its properties, which make it specially adapted for toilet-ware and such goods. J. C. Dowd & Co., 475 Broadway, New York, are sole manufacturers and owners of ebonoid, and their line of the goods, especially in toilet ware, is illustrated in their new catalogue, which will be sent to dealers on application.





SINCE July 15th our five reliable, well-posted and popular salesmen have departed for their respective territory, and are showing our handsome and up-to-date Fall line of

DIAMONDS WATCHES AND FINE JEWELRY

and we dare say that they carry the most complete stock at correct prices.

We have always made it a study to equip each and every one of our salesmen with such a line as to satisfy the wants of their respective trade, and it is useless for us to comment in detail on every branch.

We can safely say and advise you it will pay to wait for our men, who travel as follows:

MR. LOUIS BAUMAN, Texas, Oklahoma, Indian Territory.
MR. FRED BROSS, Illinois, Kentucky, Arkansas.
MR. M. STRAUSS, Missouri, Kansas.
MR. M. EISEMAN, Tennessee, Kentucky, Mississippi, Louisiana, Alabama.
MR. S. L. BAUMAN, Colorado and the West.

L. BAUMAN JEWELRY CO.

ST. LOUIS, MO.

MAIL ORDERS HAVE OUR PROMPT ATTENTION

SIAM THE LAND OF THE WHITE ELEPHANT AND ITS JEWELRY TRADE

(By the Special Representative of The Keystone.)

HIS Majesty Chulalongkorn, the present ruler of Siam and thirty-fourth king since the independence of the land of the white elephant, is a person of extraordinary ability. He speaks and writes English fluently, has a fair knowledge of French and German and is exceedingly well versed in science and art, as are his brothers. When conversing with these gentlemen one would scarcely suppose that their birthplace was in far-off Indo-China. These Siamese princes discourse on the Paris opera, Paster, the Derby races, and are as familiar with all international events of importance as any Western gentleman could be. The king, as is well known, made, some years ago, an exhaustive trip over Europe, where he visited the principal courts, and was everywhere received with the greatest courtesy and favor. He was accompanied by Her Majesty the "First Queen of Siam," and a large staff of officials. His brothers completed their education in Europe, as is the case nowadays with many sons of Siamese princes or rich mandarins, thus carrying Western culture homeward.

Siam, in many respects, is the most progressive country of Eastern Asia, especially if one leaves industrial development out of consideration, in which, of course, it cannot compete with Japan; but in many other ways the up-to-date Siamese enjoy numerous advantages over their Japanese brethren.



Silverware.

In no other country of East Asia is the aristocratic element more closely gathered together than in the picturesque, unique capital of Siam, Bangkok, for here resides the king. "Siam, c'est ton Roi!" Never was a king more *roi soleil* than is the present ruler of Siam. His throne rests not upon his people, but his people rest upon his throne. Opposition, parties, parliaments, do not exist.

The Siamese princes of note live nowadays just as those of Japan, in European dwellings, which are built at the king's expense. There they receive in a more or less European manner, and give dinners and evening banquets. The high mandarins, generals and lower princes still live in Siamese houses, built of teak wood, with brick roofs. The mandarin receives his visitors on the fine, braided matting or carpets with which the floors and rooms are laid out; the visitors sit down on these, leaning against gold-embroidered pillows made of precious silk, which are pushed behind the shoulders and below the elbows by slaves.

The Siamese are a very polite, obliging and hospitable people, and in regard to the arrangement of festivities they are genuine masters, often spending far beyond their means.

Beautiful, indeed, on the dress of the Siamese ladies be called; elegant silk jacket, with sleeves with puffs, and silk embroidered scarf slung from the left shoulder to the right hip; the head is never covered with a hat.

Jewelry is plentiful; rich collars, brooches, earrings, brooches and rings are worn in abundance. Most of this jewelry is of European origin. Though there are in the country skilled native laborers who make marvelous silver and gold ware, yet they confine their work chiefly to house-decorating pieces, church ornaments, silver vessels and like articles.

Polygamy is universal throughout Siam, and the richer a man, the more ladies he has in his harem. The fair-like palace of the king is a city in itself. A strong wall separates this royal city from the noise of the streets and canals of the Asiatic Venice. But the wall is not high enough to conceal the numerous towers and pyramids, strange roofs and gigantic statues which glitter in the glare of the hot tropical sun, dazzling the eyes of the enraptured traveler. Towers gild up to the highest points; pagodas and temple buildings with the most magnificent porcelain mosaic, with small figures, little towers gildy in all the colors of the



rainbow; roofs with peculiarly-shaped gables, and thousands of little silver bells which cause their melodious notes to resound in each breath of wind; the distorted heads of giants with huge tusks, and between high pagodas ornamented entirely with porcelain roses or blue and yellow flowers, each little leaf being imitated in porcelain. This palatial city is the residence of the last prince of India, who, as an absolute ruler, governs an independent empire; all around him, from the Himalaya to the southern point of Malacca, from Tonkin to Ceylon, all the kings and sultans, the Maharadhas, Gaikars, Nizams, and Radhas long ago lost their independence. Only the King of Siam has been able to preserve it. Not only this; he also has preserved all the pomp and splendor of the oriental princely courts up to the present day, and nowhere else can the traveler find more splendor, more strange customs and manners than in this Asiatic royal city, so opposed in all respects to our ideas of the nineteenth century.

The inner parts of the Royal Palace are incredibly rich. Gold, silver and diamonds glitter from all sides. The three magnificent rooms adjoining the dining room are real treasuries. In the glass shrines on the walls there glitter and sparkle the most precious jewels, immense diamonds and rubies, sevenfold crowns ornamented with precious stones worth millions, arns, golden vessels and objects of art, ancient Chinese and Japanese porcelain in such quantities as are only to be found elsewhere in the Kremlin of Moscow or in the old Serail of Stamboul. At the festivities in honor of European princes the whole fairy-like pomp is displayed. Princes and court officials appear in their rich and picturesque court costumes of heavy gold brocade, covered with orders; in silk stockings and boots with buckles. Over the blue, red or green glittering gold brocade coats, of European cut, are gold chains set with diamonds, and hung on these chains are the glittering Siamese arms with the three-headed elephant.

Photographs of the numerous children of the king, framed in golden frames, are kept in silver cases.

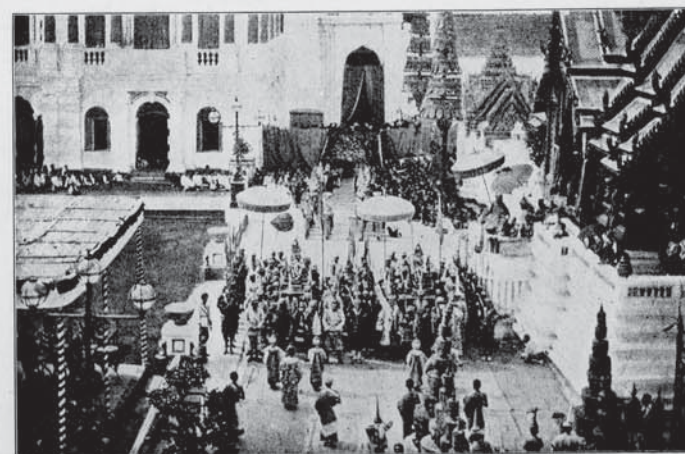
Right behind the fair-like main palace are the buildings where the royal harem is installed. This is, too, a city in itself, absolutely closed to any stranger's eye. How many inmates there are, nobody knows. The father of the present king, the famous King Mongkut, left, when he died, eight hundred children. The present king, who is forty-six years old, is said to have about the same number.

A companion of the Duke of Penthièvre, who some twenty years ago visited Siam and whom, in a weak moment, King Mongkut introduced into the harem, estimated the number of inmates by thousands. Where do they all come from? Nobody knows. Certain it is, that if an agent of the king reports to him of having seen a beautiful girl whose parents are of noble descent, his majesty sends a herald to them, asking their consent to have their daughter educated in his palace and to place her among his "Nang hams," as the inmates are called. This permission is, of course, never refused.

The prospect of having the king as a sort of son-in-law and of drawing advantages from such a connection, not seldom induces families to offer their prettiest daughter, granddaughter or niece for the "honorable position of a royal concubine."

As in all Oriental countries, jewelry finds always a ready sale. In Siam all kinds of jewelry are in demand, from the poorest and cheapest article up to the finest gold and silver pieces. It is pretty hard to ascertain the exact value of all the jewelry imported

(Continued on page 811.)




Festival in the Royal Palace.

\$12.00 per Dozen

As outlined in the July issue of THE KEYSTONE, our series of five monthly wholesalers' first cost sales will begin on August 1st. We offer for the month **one dozen fine quality, heavy link Lorgnette Chains with assorted gold slides, W. & S. B. make,** which in itself is a guarantee of quality, **at \$12.00 per dozen, net cash.** Draft on New York or Chicago to accompany the order. As the articles submitted at these sales are at wholesalers' first cost, and used solely as a medium to place ourselves in touch with trade throughout the portions of the United States not reached by our travelers, we will not duplicate an order to any one firm, or supply them at this advertised price at a later date than the advertised period of thirty days. We are sure it will be to your interest to follow us through our entire fall series, and that these special sales will enable us to participate in a share of your mail orders for Diamonds, Watches (either Elgin, Waltham or Hamilton), Solid Gold and Gold Filled Cases, Rings and Fine Jewelry, all of which we will be glad to submit to you on approval.

Yours truly,



Yours truly,

VANDER VOORT BROS., DIAMOND IMPORTERS AND WHOLESALE
WATCH AND JEWELRY DEALERS, **Buffalo, N. Y.**

LEADING JEWELERS continue
to praise the

"VICTORY" Gold Solder

Manufactured by **VICTOR FROHLICH**
Gold and Silver Refiner ST. LOUIS, MO.

Manchester, N. H.
Works very fine.
Brown & Burpee.

Geneva, N. Y.
Very good.
The Standard Optical Co.

Queen City, Mo.
The finest article that I
ever used. — R. L. Eason.

The best solder I ever had. John H. Miller.

Los Angeles, Cal.
Just the thing.
A. E. Murro.

The best I ever used.
F. A. Neeler.

Can't be beat.

Boulder, Colo.
Very good, Charles Frey.

Newport News, Va.
The best I ever used.
N. Highfield.

The best of any I have used in my 34 years'

J. Naubert.

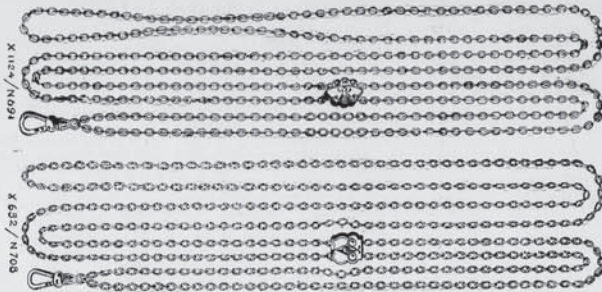
Everybody Talks

About

THE COLUMBUS RAILWAY KING WATCHES

Nothing better on earth.
Made in 18 size. 17, 21, 23 and 25 Ruby Jewels.
Send for New Price-List and Special Discounts.

The Columbus Watch Co., COLUMBUS, OHIO.



SCHOOL FOR WATCHMAKERS
NOTICE THESE FACTS: 1. We have the only horo in America put out exclusively for Horological Education. 2. We have special teachers, who give all their time teaching. 3. We have the largest and best equipped horo in America. 4. We have sent out more than 10,000 successful watchmakers. 5. We teach Watchwork, Eng'ing, Jewelry, Clockwork, Optics. **WE WILL GIVE GOOD, PRACTICAL TRAINING.** Send for catalogue.

HOROLOGICAL DEPT
BRADLEY POLYTECHNIC INSTITUTE
 AGORA, JALINOUR

SIAM THE LAND OF THE WHITE ELEPHANT AND ITS JEWELRY TRADE

(Continued from page 809.)

annually into the kingdom, as the values which appear in the official statistical returns are those declared by the import merchants and cannot be considered correct. Fine jewelry comes chiefly from London and Paris, while the great bulk of cheap goods is supplied by Austria and Germany. Some well-known English merchants, such as Mappin & Webb, for instance, have local agents in Bangkok. The more valuable jewels, such as diamonds, rubies, sapphires, emeralds, and pearls, and large quantities of silver and gold ornaments, are being sent yearly for these articles, especially for finely-mounted stones. The purchase of precious jewelry becomes more and more general in Siam, as many people consider such purchases as a good investment of capital. According to official Siamese returns, the annual imports of jewelry during the last five years varied from \$250,000 to \$275,000; but, as already stated, these figures are by no means correct. Large quantities of jewelry are directly imported by the royal court and by many rich princes, and these imports generally are not included in the official returns at all. Diamonds come largely from London. Formerly the importation was mainly of stones to be mounted in Bangkok according to the notions of their wearers, but latterly the import has been largely of mounted jewelry. Bracelets set with diamonds, and particularly with large diamonds, are very popular in the Siamese ladies, and some very valuable ones have been imported during the last year from London and Paris.

A good demand also exists for gold, silver and plated umbrella and parasol handles. The use of umbrellas and parasols is universal in Siam. The annual imports of umbrellas alone average in value some \$100,000.

Watches are imported in considerable quantities from Switzerland, but only in the cheaper grades, in nickel, steel and silver; gold and the better class of silver watches come chiefly from London and Paris. Clocks come mostly from Germany and Great Britain, and a few are reported as coming from the United States. It is stated that those obtained from this country have always made a favorable impression upon the Siamese, and there can be no doubt that with the proper efforts a large share of the market can be supplied by American manufacturers. It is only in the cheaper grades, however, that the present demand exists.

It seems that, so far, American jewelry has not yet made its appearance on the markets of Siam, though there should be plenty of opportunity for the sale of our goods. Bangkok has quite a number of good jewelry stores, and besides these, jewelry, watches and clocks are handled by a number of the great Bangkok general import merchants. The import duty is very low, amounting only to three per cent. ad valorem.

Business in Siam follows very closely the same general lines as in the United States and Europe. The houses which do the bulk of importing are reliable, and the banking or exchange facilities are first class.

In dealing with the land of the white elephant, it should always be remembered that Siam is a tropical country, and goods must be selected and packed with reference thereto. Damp heat, ever present, quickly does its harmful work unless proper protection is taken. Bangkok is a long distance from New York or San Francisco, and boxes that would suffice for an ordinary journey require extra strength to reach the Far East.

Bangkok, the capital of Siam, is one of the largest and most important cities of Asia. Its population is estimated at from 600,000 to 800,000, and it is growing



Fandangos in the Royal Palace City

rapidly. It has an excellent electric street-car system, electric lights on the leading streets, telephones and telegraphs, railroads, hotels, clubs, libraries and banks, while the river Menam, flowing through its heart, is lined with the go-downs, offices and wharves of exporting, importing and general shipping firms.

About half the people of the city are Chinese, in whose hands is centered nearly all the trade of Siam. The approach to the city by the Menam, which can be navigated by ships of 300 to 300 tons, is exceedingly beautiful, the banks being skirted by fine trees full of birds of gayest plumage. As the town is near, numerous temples present themselves and floating houses are frequent, and, finally, the whole city, with its rich gardens and shining temples and palaces, bursts into view. A large number of houses float on rafts, and their location may be changed at will. Some of the houses in the city are built of stone and brick, but by far the greater part are of wood. The floating houses are built of bamboo barks, wicker work or palm leaves, and have generally a

veranda in front with a small wing at each end. The internal traffic is carried on chiefly by means of canals, horses and carriages being rarely seen except in the neighborhood of the palaces. The temples of Bangkok are numerous and decorated in the most gorgeous style, the Siamese taking pride in lavishing their wealth on them. Some of them are said to have cost more than \$800,000.

As a race, the Siamese have been described as "gentle, timid, careless and almost passionless;" inclined to be idle, inconstant and exacting, but sincere, affectionate in their domestic relations, witty in conversation and, like the Chinese, expert in mimicry. Their religion is Buddhism, which inculcates the highest veneration for life in any form. They will not kill serpents, for instance, and the tameness of many creatures that in the United States flee from the presence of man, is observed by all strangers.

The Siamese are a small, well proportioned race, with olive-colored skin and black hair, of which all that they allow to grow is a tuft about two inches long on the top of the head—the rest being shaven off.

Siam to-day is attracting more attention than ever before, especially in England, France and Germany; and the United States, as far as commercial relations are concerned, should not overlook the field.



Main Street in Bangkok



Manufactured under
PRENTICE PATENT, JUNE 13, 1899
RHODES PATENT, NOV. 14, 1899

Phenomenal Sale of the Geneva Retinoscope

The Busy Optician's Assistant. Over 400 already in use after being on the market less than a year.

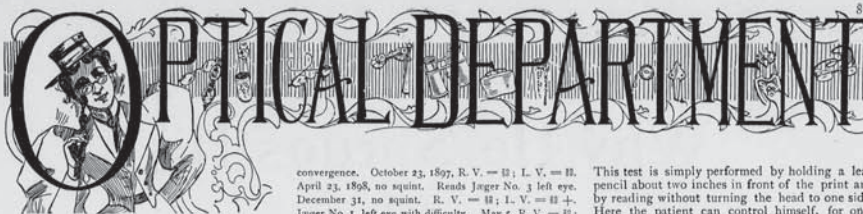
That our Geneva Retinoscope has had a wonderful sale, phenomenal from every point of view, there can be no doubt when we say that already there are over 400 sold and are being used every day among our customers.

The broad claims we made for this instrument when we put it on the market less than a year ago have been fully substantiated and the Geneva Retinoscope now stands as a thorough success.

We have numerous testimonials from our customers confirming this claim, and we are constantly receiving letters commending its good work and accurate results.

Just at the present writing is the first time since we shipped out our first instrument that we could say that our orders are all filled up to date. We have recently enlarged our factory and increased our facilities for manufacturing this really useful and helpful instrument, and the trade can depend on their orders for the Geneva Retinoscope being shipped promptly hereafter.

GENEVA OPTICAL COMPANY, Sole Manufacturers
63 and 65 Washington Street
CHICAGO



Reviews of Current Ophthalmological Literature of the World.

The Non-Operative Treatment of Strabismus: Its Possibilities.

The progress in the treatment of human ailments is quite apparent in the treatment of strabismus. In olden times the knife was the only remedy employed, and it is not so many years ago that every general surgeon considered himself justified in cutting the tendon of the overacting muscle and then sending the patient off without giving a thought to the causation of that deviation or the future function of the eye. Nowadays we have learnt that before proceeding to operate on the eye we must study the functions of the affected eye most carefully, especially its refraction, and that before the operation other means must be tried faithfully, which often will succeed by themselves to straighten the eye. But even if an operation should be necessary, non-operative means must be employed for a long time after, not only to keep the eye straight, but also to obtain binocular vision.

About this non-operative treatment Dr. A. E. Davis, of New York, lately has written an interesting article, under the title above given, in the *Post Graduate*. He calls attention to the fact that Javal must be called the pioneer in this method, as ever since 1871 he has written and worked to show the possibilities and the advantages of this form of treatment, called by him the *orthoptic* treatment of strabismus. Priestly Smith, an article of whom on a similar subject we published lately in *THE KEYSTONE*, prefers to call this method the *educative* treatment. This latter author states in one of his papers that owing to incomplete treatment in many of his cases and from other causes he was unable to give a true measure of the curability of the disorder, especially as he had no standard by which to compare his results. Dr. Davis now endeavors to get such a standard by examining the strabismus cases of the clinic of Drs. Lewis and Van Fleet, at the Manhattan Eye and Ear Hospital, for the last four years, in which, beside atropine and glasses, no educative treatment had been employed. With this standard he compared his results in his private practice, where the non-operative treatment has been carried out more or less fully in every case.

With regard to the success to be expected, all depends upon the kind of amblyopia in the deviating eye. "If the amblyopia is congenital, that is, organic, the educative or non-operative treatment of strabismus will be of but little benefit indeed; but if acquired, that is, functional, then its possibilities are wide and the outcome hopeful." He believes that the amblyopia, as a rule, is acquired, as a result of the squint, and not congenital; whilst Priestly Smith says "there is little evidence to show that an eye which has once acquired good vision can lose it through squinting." In favor of his own view Dr. Davis reports the following case, furnished him by Dr. Roosa:

May 15, 1894. X. B., aged 4½ years, does not read. Ophthalmometer shows astigmatism with the rule 1 D. (J) in each eye. Ophthalmoscope shows H. 3 D. each. Convergence squint, not now constant. April 30, 1896, R. V. = H; L. V. = H. Accepts +1 D. Squint more marked and constant in the left eye. Wears +1 D. December 3, 1896, R. V. = H; L. V. = H with his glasses. To wear right and left +.50 D. C. +.50 C. 90°, January 9, 1897, still convergence in left eye. Atropia. R. V. = H; H with +2 D. L. V. = H; H with +2 D. April 5, 1897, R. V. = H; L. V. = H. Less constant

convergence. October 23, 1897, R. V. = H; L. V. = H. April 23, 1898, no squint. Reads Jager No. 3 left eye. December 31, no squint. R. V. = H; L. V. = H +.4. Jager No. 4, left eye with difficulty. May 5, R. V. = H; L. V. = H. His mother has obliged him to use stereoscope and cover the good eye, three times a day, for 15 minutes to half an hour. January 27, 1900, R. V. = H; L. V. = H with glasses. Reads Jager No. 1 easily with each eye. No squint with glasses on. Single binocular vision.

Dr. Davis uses the following steps in his non-operative treatment:

1. An exclusion pad is used over the good eye for as many minutes or hours as is possible under the circumstances, so that the patient is obliged to look at objects with the squinting eye. This is done not only for the reason that the vision and fixation power of the deviating eye may be improved, but especially that the patient may lose his habit of suppressing the image of this eye. But it is of the utmost importance that this step should be taken as early as possible after the squint has made its appearance, and that the child should not be allowed to "peep" with the good eye by putting a piece of cotton under the exclusion pad. Here it is interesting to note that the philosopher Erasmus Darwin, grandfather of the great Charles Darwin, gave about the same advice, about one hundred years ago, when he said: "If the squinting has not been confirmed by long habit, and one eye be not much worse than the other, a piece of gauze stretched on a circle of whalebone, to cover the best eye, in such a manner as to reduce the distinctness of vision of this eye to a similar degree of imperfection with the other, should be worn some hours every day; or the better eye should be totally darkened by a tin cap, covered with black silk, for some hours daily."

2. A mydriatic, usually atropine in about 1/4 to 1 per cent. solution, is employed, one drop twice daily to see whether the paralysis of the ciliary muscle will also relax the convergence, so that the eyes become parallel. At the same time the eyes are examined for glasses.

3. Glasses help the squint not only by improving frequently the sight of the deviating eye, but especially by relieving the strain on the ciliary muscle and by relaxing the effort of convergence. Many cases of convergent strabismus have been cured by the use of atropine and glasses alone, when taken early enough. About the fitting of glasses he expresses himself as follows:

Usually in fitting glasses I do not use a mydriatic of any kind, but in convergent strabismus I always use a mydriatic, because it helps directly to improve the squint, and, at the same time, allows almost full correction to be given the patient to wear; not only this, but as most of these cases are under six years of age and cannot be tested subjectively, that is, by the trial case and test cards, it makes the objective tests easier and more accurate. I may say I never give full correction of the refractive error, even in squint cases. Because, when it is done, after the effect of the mydriatic wears off, the ciliary muscle acts to some extent, renders the eye myopic and makes the vision worse. The vision being poor already in the squinting eye, anything that makes the vision worse makes the suppression of the image easier, and the too-strong glass, instead of being a help, actually acts as a shield for the bad eye to turn behind, the patient not even pretending to look through the glass. It is always wise, therefore, to deduct .50 D. to 1.50 D. from the hypermetropia, according to the amount of the hypermetropia present. In low amounts but little should be deducted, but in high amounts more. The astigmatic correction should not be deducted from, except the usual .50 D., when the astigmatism is with the rule, as in other cases. The glasses should be worn constantly.

4. In patients who are old enough, bar-reading is one of the best helps in preventing relapses.

This test is simply performed by holding a lead pencil about two inches in front of the print and by reading without turning the head to one side. Here the patient can control himself, for only when he can read the whole line without seeing some letters covered by the pencil, is he using both of his eyes.

5. The stereoscope is very useful for children over five years of age. There are many on the market to be used for this purpose, like that of Javal or that of Dr. Derby. But even the ordinary stereoscope will do if the prisms are removed and only 4-6 D. sphericals are used. The pictures, however, must be so arranged that the right and left image may be brought farther from or closer to each other.

As to the value of the non-operative treatment of strabismus, the author concludes from his cases that at least in private practice 25 per cent. of the cases of convergent strabismus can be cured without operation, while in hospital practice, where only glasses and atropine were tried, only 4.6 per cent. were cured by the non-operative treatment. This result is slightly better than that of Priestly Smith, who cured 12 out of 55 cases completely without operative interference, that is, about 22 per cent.

It cannot be denied that a great deal of time (sometimes six or seven months) and patience are usually required for a perfect cure. But then single binocular vision is a function which is well worth some trouble.

Change in the Apparent Distance of Objects Produced by Prisms.

Referring to a query of Dr. W. F. White, in the *Ophthalmic Record*, regarding the effect of prisms on the apparent distance of objects, to which there was no reply, we gave an answer to it in the *May KEYSTONE*. Arguing on the effect of prisms, base out, we said that with such prism we saw the object farther away in spite of the increased convergence contrary to the statement of Maddox, who asserts that such prisms, base out, by increasing the necessary convergence of the eyes, make objects appear nearer. Dr. E. V. Allen had indeed made the statement that under such circumstances the objects appeared farther away, but gave the illogic reason that the prisms changed the amount of convergence and that therefore the objects ought to appear farther away, although convergence is increased in this experiment. At that time the reviewer also called attention to the researches of Helmholtz, who too, with prisms base out, had seen objects farther away but larger, whilst to the reviewer objects appeared distinctly farther away but smaller.

We now find the following correspondence by Dr. Alexander Duane, of New York, in answer to the query of Dr. W. F. White:

Dr. White calls attention to the discrepancy existing between the statements of different authors as to the effect of prisms upon the apparent distance of objects. This is a subject that has interested me a good deal, and eleven years ago I made a series of experiments to determine the facts of the case. Since then I have followed up the subject more or less, as opportunity offered, in my office practice, and I am convinced that, while Maddox's statement would seem on a priori grounds to be the correct one, the facts are as stated by Dr. Allen. In other words, I have uniformly found that with converging prisms (prisms base out) the patients either alleged that objects appeared to be at the same distance as without the prisms, or in the majority of cases said that objects looked smaller and farther off. In no instance, so far as I can recollect, did prisms base out make objects look nearer than they really were. Moreover, the indications in my series of experiments were that those who alleged that the prisms made no difference in the apparent distance of objects were either inattentive

(Continued on page 817)

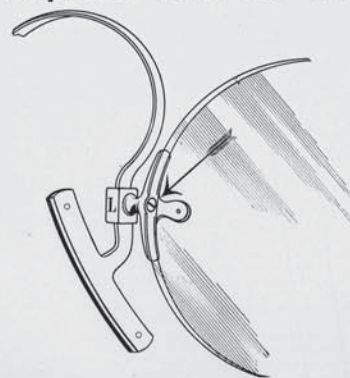
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Reviews of Current Ophthalmological Literature.

(Continued from page 815.)

by were speaking according to their prepossessions, and not according to actual observation. Hence, so far as my experience goes, the effect of prisms base out is to make objects look farther off than they really are.

That this effect is due to the effect of convergence set up by the prisms, and not to any alteration in the size of the image or other optical illusion, produced by the prism itself, is evident from the fact that so long as the observer fails to exercise his convergence, i. e., does not make any effort to unite the double images that he sees through the prisms, these images appear of their natural size and at their natural distance. As soon as he forces the images together, the single image produced by their fusion at once appears small and resumption of the normal size.

That the actual size of the image is not diminished is likewise proved by the fact that the smallest type visible at the given distance without the prisms is also visible with the prisms, provided the accommodation is relaxed, or provided a concave glass is superadded to compensate for the spasm of accommodation produced by the prisms.

The explanation of this phenomenon is not easy. I at one time thought that the spasm of accommodation set up by the effort of convergence might be responsible for the illusion; but this view seems effectually negated, inasmuch as the phenomenon is just as apparent when the accommodation is paralyzed by atropine.

It will be seen that Dr. Duane's views on this point are the same as those of the writer. An explanation of the phenomenon might perhaps be given in this way: The first unconscious judgment from the increased convergence would be to consider the letters nearer, but we are prevented to conclude this for several reasons. Knowing the real size of the letters and finding that the retinal images are not changed in size, we conclude that the letters must be smaller; because, otherwise, letters of the known size, looked at with the naked eye with that degree of convergence, would give larger retinal images. Thus the smallness of the letters might be explained. Furthermore, we feel that we need not use our accommodation more than before and we therefore know that the letters cannot be nearer; on the contrary, we consider them farther away, because the refraction through the prism takes away from the letters the shape and distinct outlines which they had before and which would be natural if they had been removed farther away. Our mind thus finds the best explanation of the visual impressions in the assumption that the letters had become smaller and been removed to a greater distance. We, therefore, conclude that the letters are smaller and farther away. Other people, like Helmholtz (Helmholtz, "Physiol. Optics," 2d ed. p. 806), probably judge differently. In their mind the impression that the letters are farther away is uppermost, and they judge that the letters must be larger because only larger letters if farther removed would produce the unchanged retinal image. But it would seem from Duane's researches that the majority of people belong to the class first described.

The New Snellen Eyes.

In the October number of THE KEYSTONE, of last year, we gave several cuts illustrating the new artificial eyes of Snellen. This well-known ophthalmologist said that the new hollow glass shapes (Figs. 2 and 3) were loudly praised by

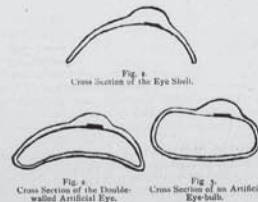


Fig. 2. Cross Section of the Eye Bulb. Fig. 3. Cross Section of the Double-walled Artificial Eye.

his patients, as they caused much less irritation than the old forms (Fig. 1), were easily inserted and removed and had been worn even during the night without inconvenience. He further observed that the eye-lids and conjunctival sacs easily adapted themselves to the rounded margin of these new eyes, so that even if the eyes fitted only imperfectly at first they gave more satisfaction after having been used a short time. These new eyes are made by Müller Bros., in Wiesbaden, Germany, out of thin, light but strong glass, weighing on the average about 45 grains. They are not much more expensive than the old shells, but it seems that it is difficult to obtain them in this country, as is evident from the following editorial in the *Ophthalmic Record*:

The New Snellen Eyes.

Since Snellen advocated the double-walled artificial eye, to be worn in the socket after enucleation of the eye-ball as a substitute for the shell, we have been patiently waiting for some enterprising optician to put in a small stock of these new eyes that we might give them a trial. Meyrowitz imported a few samples, a few of which I obtained, and from them found one that was suited to the orbit of a patient in hand. I had enucleated the left eye of this patient one week prior to the adjustment of the Snellen prosthesis. Having instructed him how to insert it and remove it, he was told to remove it in the course of a few hours. This he did not do, but wore it the entire day, and reported the next day with it in position, stating that he had had no inconvenience from it. I found the eye free from secretion, and am now pleased to report that after a period of two months the eye is free from secretion and epiphora, and the stump is free from irritation. The cosmetic result is as good as after Mules' operation. This case encourages me to hope that we have in the Snellen eyes a means of accomplishing all that can be obtained from the substitute for enucleation. I write this to urge others to ask their opticians to put in a supply of these eyes. If this is done we shall soon have a supply of them in this country. It may be that some progressive optician has already laid in a stock. The readers of this journal would no doubt be glad to know the address of any such firm.

MELVILLE BLACK.

We hope that our progressive opticians will soon be up to this expectation.

Changes in Refraction.

That the human eye is not like an optical apparatus which remains unchanged forever, if left alone, everybody knows who has a little experience in testing the refraction of eyes. The refraction undoubtedly changes quite frequently during the life of the patient, but it is impossible to say in a special case what change is most likely to occur here. In an interesting article in the *Ophthalmic Record* Dr. Howard F. Hansell, of Philadelphia, gives his experience in regard to this change after seven years in 200 consecutive cases of refraction. Among his 400 eyes there were 249 cases of H., 24 of which showed no change, and 114 cases of M., 37 of which had still the same refraction after a period of seven years.

The following two tables show the changes in detail:

TABLE OF NO CHANGE IN REFRACTION OF 249 EYES ACCORDING TO DECADE AND DEGREE OF HYPEROPIA.

	H. Eyes	No Change	Less than 2 D.	2 to 4 D.	Over 4 D.
To 20th year	70	26	21	1	3
To 30th year	50	20	16	3	3
To 40th year	56	29	15	1	2
To 50th year	47	17	10	3	4
To 60th year	16	2	None	2	None
To 70th year	10	None	None	None	None

TABLE OF NO CHANGE IN REFRACTION OF 114 EYES ACCORDING TO DECADE AND DEGREE OF MYOPIA.

	M. Eyes	No Change	2 D. or Less	2 to 3 D.	3 D. and Over
To 20th year	26	5	1	1	3
To 30th year	43	8	5	2	1
To 40th year	22	5	5	5	6
To 50th year	20	7	0	None	1
To 60th year	3	1	None	None	None

These changes are expressed in percentage in the following table:

CONDITION OF REFRACTION AFTER LAST EXAMINATION OF 400 EYES.

	Total Eyes	No Change	Increase	Decrease
To 20th year	97	32 per ct.	42 per ct.	25 per ct.
To 30th year	108	28 "	50 "	21 "
To 40th year	89	52 "	32 "	15 "
To 50th year	74	36 "	17 "	40 "
To 60th year	22	18 "	13 "	63 "
To 70th year	10	None	None	10 "

The author concludes from his statistics (1) that a large number of patients, being carefully corrected, needed no change for a number of years; (2) that in the third decade of life there was the greatest increase of refraction, less in the second and a rapid decline in the proportion of increases after the thirtieth year; (3) that the decrease of refraction was lowest in the fourth decade, and that in later years the ratio showed a marked and rapid increase and the tendency to decrease in refraction was greater than the tendency to increase; (4) that no rule can be formulated that shall determine when a change in the correction is indicated, but that we must be guided rather by the age than by the refraction.

Repair of Field Glasses and Telescopes.

Amongst the multitude of repairs constantly brought in to the provincial watchmaker, probably the most puzzling and difficult to deal with are general optical repairs and alterations. Still, many of them can be done successfully by the use of a little thought and intelligence.

In the case of field glasses the most common fault is in the screw and stop-pin. In the case of the telescope the screw is not exactly the size of the old one, the stop-pin can easily be made and fastened in by filing a piece of brass wire up in the hand vices to the proper size. Should one of the object glasses be broken it will necessitate getting a new pair of object glasses of the same size from the wholesale house. Some retailers think they can be matched, but this is rarely the case. The object glasses of field glasses run in the following sizes: 15 lines diameter, 17, 19, 21, 24, 26 and 28 lines. In the case of the lenses of the eye-pieces, if belonging to a six-line field glass, the lenses are stocked in the rough and can be had from the wholesale houses. It is not difficult to cut them down and grind the edges to the required size. If the eye-piece lens of an 8 or 10-line glass requires replacing, the only plan is to order a pair to match the old ones.

Binocular telescopes are much more difficult to repair. Should one of the lenses in the inner draw-tubes be broken, it can be matched as regards focus by the wholesale house, and then cut down and ground to the required size. Sometimes stains appear in the lenses. These can be removed by repolishing the surfaces. In some cases spots appear underneath the surface of the glass, caused by the Canadian balsam, which cements the lenses together, giving way. They will then require rebalancing. In this case it is best, after taking them out of the cells, to put them on a steel plate over a smokeless jet, and when the balsam is melted separate the lenses, clean them with methylated spirit and recement them with good clear balsam.

If the object glass of a telescope is broken a new lens to match can be obtained from the wholesale house up to 19 lines diameter. If the body of the telescope gets dented it will necessitate the removing of the leather covering and knocking up the dent to its proper place by means of a smooth-faced hammer and a tribler. If badly dented it will probably be necessary to unsolder the end pieces, and after removing the dent resolder them; the interior can then be blackened with a dull black made of methylated spirit mixed with lamp black, the body being warmed first and the black being put on with a camel's-hair brush.

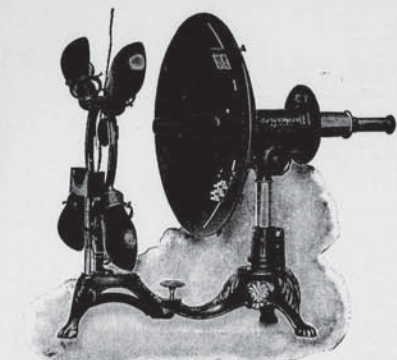
In field and opera glasses customers often complain of their seeing two rings, and getting a double ring of the object looked at. This is generally caused by a fall having altered the position of one of the tubes and can be corrected by grasping the glass firmly in both hands whilst looking at some object and bending them back to their original position; in some cases it may be caused by the glasses themselves being either too broad or too narrow in the center; this is why many people prefer a jointed field glass.

—The London Watchmaker, Jeweler and Silversmith.

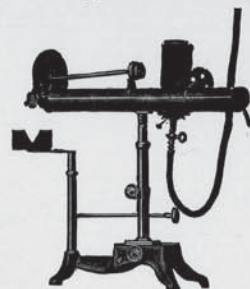
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AUGUST, 1906

THE KEYSTONE

819

The Optician's Manual.

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The chapters previously published are as follows:

- CHAPTER I.—INTRODUCTORY REMARKS.
- CHAPTER II.—THE EYE ANATOMICALLY.
- CHAPTER III.—THE EYE OPTICALLY; OR, THE PHYSIOLOGY OF VISION.
- CHAPTER IV.—OPTICS.
- CHAPTER V.—LENSES.
- CHAPTER VI.—NUMBERS OF LENSES.
- CHAPTER VII.—THE USE AND VALUE OF GLASSES.
- CHAPTER VIII.—OUTFIT REQUIRED.
- CHAPTER IX.—METHOD OF EXAMINATION.
- CHAPTER X.—PRESBYOPIA.
- CHAPTER XI.—HYPERMETROPIA.
- CHAPTER XII.—MYOPIA.

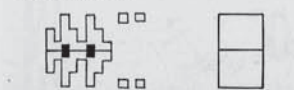
The first ten chapters have been republished in book form with additional matter, illustrations and colored plates, price \$4.00. Chapters XI and XII have also been published in book form under the title "Supplement to the Optician's Manual," price \$1.00. These books will be sent, postpaid, to all parts of the world, from this office, on receipt of price. Or can be had from the leading wholesale optical houses of Great Britain, 20, 21, & 22, Strand, E. C. 4, London, W. C. 2, or from the Optician's Manual, and as an ad. for the Supplement.

CHAPTER XIII. (Continued.) ASTIGMATISM.

About twenty years ago Javal and Schiotz commenced to alter and improve the instrument so as to adapt it for office use, but it is only about ten years ago that the present model was perfected, and as now constructed it seems almost to have reached the limit of improvement. The word "Ophthalmometer" literally means an "eye measure," and, strictly speaking, should be applied only to an instrument which measures the refractive condition of the whole eye; whereas, this instrument is designed only to measure the radius of curvature of the cornea in its various meridians, to which the term "Keratometer" would be more applicable.

The essential parts of the ophthalmometer are a telescope, which contains an arrangement for doubling the images seen through it; and a set of mirrors or reflectors, which are capable of approximation and separation. The telescope contains an eye-piece, two objectives, and a bi-refracting prism, the latter being made from the best mountain crystal quartz, which possesses the power of doubling objects when ground in a certain direction with regard to the axis of the quartz. This prism is in reality composed of two prisms, the base of one placed over the apex of the other, in such a way as to cause the deviation to take place from each side, and as each prism produces a certain degree of deviation, twice the amount of separation is secured, and at the same time the doubled images can be kept nearer the center of the field. And the prisms are placed in the telescope in such a way that their plane of doubling is in exact line with the plane of the graduated arc.

The prisms are so adjusted as to produce a separation of three millimeters when the telescope is properly focused. When, therefore, the cornea is viewed through it there is the appearance of two corneas, and every object reflected from its surface is displaced 3 mm. as well as doubled. If the image of such object happened to be 3 mm. in length, the two images seen would have their edges just in contact.



The two mires that are used are illustrated in the above diagram. One is a simple white black line, and the other has a series of steps, arranged in groups, so that they can be readily counted, both of the mires having a black line running directly in the middle, which may be called the guide line, and is parallel with the plane of the arc. These lines serve to show when the arc is in one of the chief meridians of curvature of the cornea,

that is, when in the meridian of longest or shortest radius of curvature. When in either of these meridians, the two lines are straight, opposite each other and apparently continuous. In all other meridians the lines run somewhat obliquely and are separated one above or below the other. If the cornea had the same curvature in all meridians, the lines would remain straight and continuous, no matter in what position they were rotated.

As the determination of the two chief meridians in any case of astigmatism is one of the first and most necessary points, and as this is accomplished by means of these guide lines, it is obvious that they are of much importance. The location of the principal meridians is shown by an indicator which is movable with the mires and points to figures on a dial, where the meridians are marked in degrees of a circle.

The curvature of the cornea is measured by determining how large an object is required to give a reflection from the cornea just equal to the separation of the doubled images. It is evident that the images reflected from the cornea will vary in size according to its curvature, being larger when the radius of curvature is longer, and grows smaller as the radius is shorter. Hence, it follows that the size of the images reflected from the cornea bears a direct relation to its radius of curvature, and when the first is measured and known the second can be calculated.

The distance of the object is maintained fixed and constant by means of the arc, and the size of the corneal reflection is also a constant quantity, because it is measured by the amount which the prism separates the two images at the fixed distance. From these two factors a scale has been calculated by which a certain size object will correspond to a certain radius of curvature of cornea.

The graduated arc, which carries the mires, is concentric with the cornea. It is graduated into equal spaces and numbered, commencing at the center and extending outward in each direction. Each of these divisions represents one diopter. For example, when the cornea is in focus and the arc in the horizontal position, and the reflections of the mires show them to be just in contact when they are standing on each side of the arc as at 20, then the horizontal meridian of the cornea represents a refractive power of 40 D. Now the arc is turned to the vertical meridian, and the reflections overlap, then the mires must be moved outward until the images are simply touching again. If the mires are then located at number 21 on each side of the arc, the refractive power of the vertical meridian of the cornea is equal to 42 D, which is an excess of 2 D. over the horizontal, and indicates an astigmatism of that amount.

The images of the mires as reflected from the cornea are farther apart on one of longer curvature, and nearer together on a cornea of shorter curvature, and therefore when the mires are set in such a position as to correspond to the normal or average radius of curvature, if the mires must be approximated there is evidence of less refractive power and a presumption of a hypermetropic condition. Whereas, if the mires would need to be separated, in order to allow of simple contact, there is evidence of an excess of refractive power and a presumption of myopia.

PRINCIPLE OF THE OPHTHALMOMETER.

The principle on which the ophthalmometer acts in measuring the radius of curvature of the cornea in its various meridians, and thereby revealing the existence of corneal astigmatism, depends on the measurement of the size of an image reflected from the surface of the cornea.

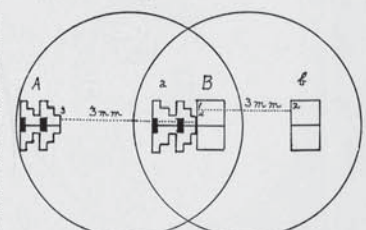
In order that this may be the more readily accomplished, it is first doubled by the bi-refracting prism in the telescope of the instrument. The inner edges of the two mires furnish the objects of observation. As everything is doubled, it must be remembered that four mires are visible. A and a are the images of the

stepped mire and B and b the images of the plain mire. In practice, the two outer images A and a are disregarded, the whole attention being fixed on the central images B and b. The distance x to x between the inner edges of the plain mire, and the distance y to y between the inner edges of the stepped mire, each represent the amount of deviation caused by the prism, which is 3 mm. (The diagram is incorrect in that it does not show these two distances exactly the same.)

It might be well to repeat that the ophthalmometer is not intended to determine the nature of the refraction, whether hypermetropic or myopic, except in the indirect way, which has already been referred to, and which is not to be relied upon. The scope of the instrument is to measure the anterior surface of the cornea, and to reveal any differences of curvature in its various meridians, which is essentially astigmatism. Hence, the stepped mire is provided, which indicates the amount of astigmatism by the overlapping or separation of the mires in the several meridians, the mires being so constructed that each step represents one diopter. If the cornea is uniformly curved in all of its meridians, there is no change in the relative positions of the two mires as they are moved through the different meridians.

METHOD OF USING THE OPHTHALMOMETER.

A good light is essential. Daylight from a large window with a northern exposure will answer the purpose, but artificial light is better. Four electric lamps surrounding the face of the patient are preferable on account of their convenience, although two Welsbach gas burners with suitable



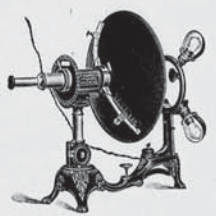
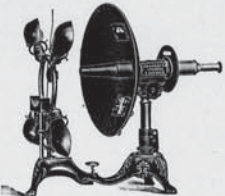
reflectors, one on each side, afford just as good an illumination.

The patient is seated with his chair drawn up close to the table, with his chin upon the rest provided for that purpose, his forehead pressed firmly against the head-rest and his face in comparative shadow. The eyes should be wide open, the one under examination being directed into the opening of the telescope, while the other may be covered with the metal shade. The patient's head should be in such a position that the eyes are horizontal, because if the head was tilted and one eye higher than the other, the apparent location of the meridians would not be true, but might be 5° or 10° off from what they really are, and hence would not correspond with other tests and could not be relied upon.

The mires are placed at those points which indicate the normal radius of corneal curvature, and the graduated arc must be exactly in the horizontal position. The operator looks along the telescope to see that it is turned towards the patient's eye, and its height is adjusted to correspond by means of a large hand-screw. Then he looks through the telescope and brings it into focus, which is accomplished by sliding it backwards and forwards on the stand, and perhaps to one side or the other, until the cornea of the patient occupies the field of view, and the reflections of the mires will appear sharp and clear. Attention is directed solely to the two central images, which should be exactly in the center of the field.

(TO BE CONTINUED.)

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Optical Questions and Answers.

Subscribers wishing inquiries answered in this department must send name and address—not for publication, but as an evidence of good faith. Questions will be answered in the order in which they are received. No attention will be paid to anonymous communications. To enable us to answer questions satisfactorily and give proper advice in the management of cases submitted to us, it is essential that we be furnished with a complete history of each case and accurate information on the following points:

1. Age. (If not possible to give exact age, always approximate.)
2. Have glasses been previously worn? How long and what number?
3. Visual symptoms of each eye, and what time of day glasses are worn.
4. Range of accommodation (without glasses and with them).
5. Visual symptoms of accommodation (with and without glasses).
6. Test for muscular inflexibility.

"H. E. J."—Girl, aged twelve years; good health. Has been using a friend's glasses, which proved to be R. E., +.50 cyl. ax. 45°; L. E., +.50 cyl. ax. 135°; but neither of these correct the astigmatism. Used atropine, but could not get any satisfactory results. The best was: R. E., +.25 D. +.25 cyl. ax. 45° = 1 and about half of L. E., +.25 D. +.25 cyl. ax. 45° = 1. These do not correct astigmatism, but only change only changes the direction of darkest lines. Sometimes the darkest line would be from XII at VI, and instead of darkest line being at right angles they were I at VI and XI at V. I gave +.50 in each eye and asked her to return in one week. Was that all right and do you think it probable that she would her eyes satisfactorily using cyl. lenses, and if so, would using spherical lenses tend to overcome this? She could see 10 and part of 3 with spherical lenses, +.50 for R. E. and +.37 for L. E., before I gave atropine.

From our reading of the history of this case we do not understand that there is any latent hypermetropia nor astigmatism. If the astigmatism of vision is not corrected, the eyes are under the influence of the mydriatic, there certainly cannot be any hypermetropia present in the case, because the drug, if properly used, develops the latent vision we can arrive at it if no astigmatism is present, or at least not in sufficient amount to call for correction. It certainly is not right for one person to wear another's glasses, unless, as might happen occasionally, the defect is similar in both persons; but we are hardly prepared to say that the wearing of these weak cylinders could make any pair of eyes astigmatic. In this case there was just one course to pursue, and that was the one followed by our correspondent in giving spherical glasses, the only question being as to how strong a pair the eyes will bear. The eyes are not the symptoms of which this girl complains, and hence we are unable to judge how great a need for glasses exists. At any rate, weak spheres are entirely proper, and then if the patient should still complain attention must be given to the condition of the muscular equilibrium, of which we find no record in the history above given.

"J. A. W."—Lady, aged forty-four years. Made her a pair of bifocal glasses. V. A. of R. E., B. took +.25; V. A. after correction, B. V. A. of L. E., B. took +.25 D. = 1.75 ax. 90°; after correction V. A. was B. Added +.25 to above for reading. Second test proved above to be correct. After trying for three weeks to wear them, she came back and said everything appeared to be correct. When looking at a dish-pie it would appear to be oval, instead of round. The floor always appeared to be up on the right and down on the left, a time of about a foot in every five. What is the trouble and remedy?

It is always of advantage to know something of the history of the case, and one of the most important points in that history is as to whether the patient had ever worn glasses previously, and if so, what number, how long and with what satisfaction? This would be important knowledge in arriving at a conclusion in this lady's case, because, as has been frequently stated in these pages, there is always more or less difficulty for the eyes to adjust themselves to new glasses in a patient of middle age who had never worn them. In a consideration of this case there is one thing that stands out prominent, and that is the goniometric condition of the eyes. Now it is always a matter of some difficulty, even in young persons, for glasses which differ so widely as these to be worn with comfort when first prescribed; and the older the patient the greater the difficulty. It is not unusual for astigmatic patients to be so with the complaint that things do not have their proper shape and appearance; a square object will have slanting sides and appear wider than it is, and the other.

That the distortion of which this lady complains is not unusual and will probably pass away if she perseveres in the use of the glasses is, in the opinion of the writer, in any case, a foregone conclusion. In any case, in the upper part of the floor, which is up on the right and down on the left, part of the trouble may perhaps be attributed to the prismatic action of the bifocal glasses. Nearly every pair of bifocals will show some prismatic effect in the vertical direction. If this patient continues to experience these troubles of which she complains, we would advise an abandonment of the bifocal form glasses and instead have two pairs, one for distance and constant wear, which should be never left off except when engaged in close work, for which the second pair should be adjusted. It is possible that after the eyes in this way become accustomed to the glasses, that a return may be made to the bifocal if convenience seems to demand it.

"P. H. S."—+.50 D. sph. C. = -.75 D. cyl. ax. 180°. Does it equal +.25 D. cyl. ax. 90°?

This question of our correspondent would indicate that he does not understand the transposition of lenses. The formula first mentioned being a sphere-cylinder with opposite signs, cannot by any manipulation be reduced to a plain cylinder. A lens like this is really equivalent to a cross cylinder, which would read as follows: —.25 cyl. ax. 180° C. +.50 cyl. ax. 90°. Now the rule for the transposition of two cylinders with dissimilar signs, when their axis are combined at right angles to each other, as given in the chapter on Astigmatism in the "Optician's Manual," is as follows: "Take either one of the cylinders for the spherical, and the sum of the two for the cylinder, with the sign and axis of the latter." By following this rule we can get three formulae, each of which is the optical equivalent of the other.

— .25 cyl. ax. 180° C. + .50 cyl. ax. 90°.
— .25 sph. C. + .75 cyl. ax. 90°.
+ .50 sph. C. — .75 cyl. ax. 180°.

It should be remembered that a refractive force of —.25 D. is desired in the vertical meridian and of +.50 D. in horizontal, which is afforded by each one of the formulae mentioned above. In the combination first mentioned by our correspondent, the +.50 sphere affords the desired power in the horizontal meridian, whereas in the vertical, where a concave is desired, the sphere must first be neutralized and then the desired concavely supplied, which is accomplished by means of a —.75 cyl. ax. 180°. In the other sphere-cylinder to which this can be transposed the —.25 sphere is just right for the vertical meridian; but in the horizontal, where a convex is called for, this sphere must first be neutralized and then the desired convexity supplied, which is accomplished by means of a +.75 cyl. ax. 90°.

A careful study of these formulae in the light of the explanation given, will probably serve to make the above transpositions clear.

In order that a correct and definite understanding may be had of each case submitted, it is necessary that correspondents should give off the particulars asked for at the heading of this page.

"H. O. R."—Young man, aged twenty-seven years. Has worn glasses ten years. For past two years has worn following correction with some satisfaction: R. E., +.175 D. C. +.1 D. cyl. ax. 90°; L. E., +.1 D. C. +.1 D. sph. base out. Without glasses, both eyes, vision B. R. E. vision B. L. E. vision B. R. E., +.25 D. C. = .50 D. cyl. ax. 175°, vision B. L. E., +.25 D. vision B. Both eyes together vision out of four and can read at different cards hanging side by side at the same time. Maddox red over right eye horizontal, streak is about a foot to right and requires 8° prism base out to bring over flame, and then streak can be seen to gradually fluctuate to right about an inch and then back to flame. Maddox red set vertical requires 8° prism base up to place streak through flame. Patient says he is satisfied that has always impressed image in right eye. The retinoscope, ophthalmoscope, ophthalmometer and trial lenses agree on R. E., +.175 D. C. = .50 D. 175°. L. E., +.125 D. C. = .50 D. 175°. Should I give him 2° prism over each eye base out, or what shall I do? What shall I do about the hyperphoria or esophoria?

If this patient can see two cards hanging side by side at the same time, he has diplopia, and then the prism that would be required to correct this double vision would be the measure of the muscular defect. Diplopia is a different condition from muscular insufficiency. In the first condition the double images are present and the relation they bear to each other indicates which muscle is affected, while the prism required to fuse the images indicates the degree of defect. In muscular insufficiency, on the other hand, we must first produce an artificial diplopia by means of a prism, before we can determine the nature of the trouble and which muscles are insufficient.

In the case under consideration the condition of the refraction seems to have been accurately determined, and this being the case, if relief is not afforded, then we must turn to the muscular system as probably requiring attention, when we find both an esophoria and an hyperphoria. We would be inclined to suggest a correction of the latter trouble first, because it is well to know that an insufficiency of the vertical muscles causes more trouble than of the lateral muscles; partly because they are so much weaker and partly because the latter are assisted by the accommodation. We would suggest a prism of one degree base up over one eye and one degree base down over the other, to be combined with the proper lenses, and watch the results. Usually this will afford more satisfaction than a correction in the esophoria. In any case, if a strain is taken off the vertical muscles, very often the lateral muscles become more normal without any further aid. We have here a patient who has been advised to wear each eye full to afford relief, it may be desirable to increase them; and then, if after the hyperphoria is corrected, the patient still suffers, attention must be given to the esophoria and prism prescribed base out, commencing with a weak number and gradually increasing as the symptoms call for further relief. In a case like this, the prism over one eye may be base up of the strength necessary to correct the hyperphoria, and over the other eye base out of the strength found necessary to correct the esophoria; or the two may be combined at an oblique angle.

"O. H. R."—Married lady, aged thirty-eight years. Vision B both eyes. Has never worn glasses. Near vision normal. Suffers with severe splits of head-ache. Pain runs from right eye-ball back of right ear with a feeling of constriction. Patient's health is quite good. Ophthalmometer reads +.50 cyl. ax. 180° both eyes, with which she reads B and can see about as well with ax. at 75° or 180° as with above correction, ax. 180°. Maddox red over right eye horizontal, streak is about two to three inches to right of flame and requires 2° prism base up to bring streak in flame. With 8° prism base up over right eye requires 2° base out to bring candle in line, but lower candle gradually moves out and back. Retinoscope shows hyperphoria between +.25 D. and +.50 D. with slight astigmatism. I gave her +.50 D. over each eye and advised her to wear them for three weeks and come back. Should I give her prism? If so, what degree? Or, is it a latent hyperphoria of a higher degree than my estimate? Have not used mydriatics. Please advise me; inasmuch as the muscular test does not agree I am at a loss to know what to do.

Our correspondent has not given us all the data we need in order to express an opinion on his case. Vision equals B, but he does not tell us whether or not convex lenses are accepted for distant vision. This is the first point we need to know, in order to determine whether or not hypermetropia is present. The next point on which we must have information is as to the position of the near point and the amount of amplitude of accommodation that is present. This often enables us to determine the presence of hypermetropia in a latent form, which has escaped detection by other tests. There is no occasion to use a mydriatic in a case of this kind, for the test of distant vision with convex lenses and the measurement of the near point will usually enable us to determine the condition of the refraction and whether convex lenses are to be used.

In regard to the presence of astigmatism, we scarcely think that it can be found in this case. The fact that she reads through a cylinder as well when the axis is moved to different meridians, would indicate that this defect, because, when it is present, there is always one position of axis where the vision is clearest, while a departure from that position always makes it indistinct. In regard to the ophthalmometer, it should be remembered that it usually discloses an excess of refraction in the vertical meridian of about .50 D., so that when we see this amount present we would regard the case as normal; whereas, if we found an excess of 1 D. in this meridian, we would regard the astigmatism present as equal to only .50 D. Having determined the refraction in this way, attention should then be given to the muscular equilibrium; and the tests made use of by our correspondent show hyperphoria of two degrees and an esophoria of three degrees. If the spherical lenses that should be prescribed fail to give relief, then we would suggest first a correction of the hyperphoria by a 1° prism base up over one eye and then later, if necessary, a 1° to 2° prism base out over the other eye.

"W. E. H."—Girl, aged fifteen years; large and tall for age. R. E. turns outward; left and inwards when moved. Seems to have no vision neither close nor far. With left eye closed, V. in R. E. sb. No glass improves it. With any glass between +.25 D. or —.1 D. vision remains the same. Any glass, either + or —, alters vision. L. E., V. sb. With —.25 D. V. sb. Has been wearing —.150 D. glass to both eyes off and on for about six months (prescribed by an oculist). Did not wear them steady on account of lashes touching glasses. With them, vision was B. L. E. She felt drowsy when asked about three years of age and soon after that her parents noticed eye turning outward. It is not noticeable much, only when looking steady at an object. What glasses do you advise, or do you advise tetraocry?

This is a case which should have received skilled attention many years ago, and thus probably the vision of the squinting eye might have been preserved. For the same reason that convergent strabismus is caused by hypermetropia, divergent strabismus accompanies myopia. In both conditions the eyes are properly fitted with glasses at an early age, or just as soon as the child commences to go to school. In this way the tendency to deviation can be checked and the eyes maintained in a parallel condition. If, however, the eyes are nearsighted, the strabismus develops and becomes fixed, the sight then is impaired, because the deviating eye does not participate in the act of vision, and then glasses are no longer able to restore the eyes to parallelism. This seems to be the history of the case under consideration. Our advice would be an operation to straighten the eye, but it is doubtful if this would benefit the vision in the right eye. But outside of this, the cosmetic effect is something to be desired in a young lady of this age. The eyes are now in a most unfavorable condition, and it is possible that the vision may be improved by careful and continued exercise. The eyes should be kept as far as possible from any strain. The —.250 glass mentioned by our correspondent raises the vision only to B. We would expect in a child of this age, with so slight a degree of myopia, to be able to raise the vision to normal. Therefore, we would advise another very careful examination, and would suggest that probably the combination of a cylinder might cause a further improvement. If not, we must be content with the spherical alone, always remembering to give the very weakest glass with which the patient can get satisfactory vision. These glasses may seem a little irksome at first in reading, but the patient should be advised to continue their use and to keep her books as far away from her eyes as possible.

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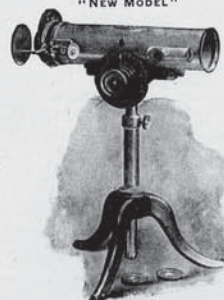
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The Centering of Spectacle Lenses.

Read before the British Optical Society, by W. A. Dixey.

In dealing with the subject of the centering of spectacle lenses, it is necessary at first to define what we mean by the center of a spectacle lens. Because throughout this paper I intend to disregard the thickness of the lens, and the position of nodal points. They do not affect the problems which the subject will present; and for our present purpose we may define the center of a spectacle lens as that part of the lens through which light passes without deviation; or, more exactly, the center of a spectacle lens is that part of the lens through which a normal ray of light passes without deviation.

It may also, perhaps, be as well to define one or two other terms of which I have made use in the course of this paper. In passing through any part of a spherical or cylindrical lens other than the centre, light is bent out of its course. This bending quality of a lens is alluded to as *prismatic effect*; and the alteration in the course of the ray of light is referred to as its *deviation*. There is another aspect of the same fact which requires its special word. If an object is looked at through the edge of a lens its apparent position is altered. This alteration in the apparent position of an object I call *displacement*. So that there are these three terms, prismatic effect, deviation and displacement, which are all different aspects of the same thing; prismatic effect referring to the quality of the lens, deviation to the effect on the light, and displacement to the apparent effect on the object. I may also note that in dealing with an oblique displacement, or a deviation in an oblique direction, I have generally found it convenient to resolve the obliquity into its horizontal and vertical elements. This is particularly useful in treating of spectacle lenses, as there is so much difference between the action of the muscles which control the horizontal movements of the eyes and those which control their vertical movements.

Let us take some ordinary spectacle lenses to illustrate our definition of the center.

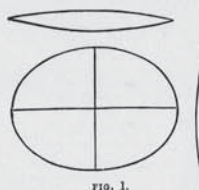


FIG. 1.

Fig. 1 represents a convex spherical lens with vertical and horizontal sections. It is clear from the shape of the horizontal section that all light passing through it must be bent either to the right or to the left, except in the thickest part where tangent lines would be parallel. And this would be true whether the section were made through the middle or above or below it. In respect, then, of horizontal deviation, we can see that the vertical line on the plan represents the position of no deviation. Similarly if we look at the vertical section we shall see that the focus of no up or down deviation is the horizontal line. It is clear then that if the vertical line represents that part of the lens where there is no lateral deviation, and the horizontal line represents that part where there is no up or down deviation, the only part of the lens where there is no deviation at all is the point where these two lines cross. That is the center of the lens.

Let us take the case of a plane cylinder. Fig. 2 shows such a lens with a vertical axis. This is much simpler, because it is evident there is no up and down deviation, and the place of no deviation is the apex of the cylindrical curve, which is represented by the vertical line in the figure. Here then the center is not a point but a line.

And let us note, for this is important, that the center is a vertical line only when the axis of

the cylindrical curve is vertical. But when that is oblique, then the center of the lens is also an oblique line.

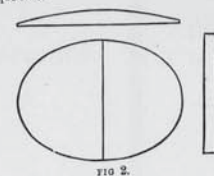


FIG. 2.

Let us see how this oblique axis affects the lines of no deviation when the cylinder is combined with a spherical lens. Take a lens sph. + 2.00 cyl. + 2.00 ax. 45°. We have seen that so far as the spherical lens is concerned, the lines of no horizontal and vertical deviation are represented respectively by the vertical and horizontal lines; also that so far as the cylindrical lens is concerned the line of no deviation coincides with the principal axis of the cylinder. The upper oval in Fig. 3 shows these lines and the arrow heads indicate the directions of the displacements caused by the spherical and the cylindrical curves. It is clear that in parts of the lens the displacements or the deviations due to the two components of the lens are in the same direction, and the deviation is therefore increased; but in others the two lenses act in opposition, and the deviations are therefore neutralized.

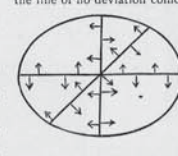


FIG. 3.

The result is shown in the lower oval of Fig. 3. The locus of no horizontal deviation is a line lying between the vertical line and the axis of the cylinder, represented by the line A B; and the locus of no vertical deviation lies between the horizontal line and the axis of the cylinder, and is shown as the line C D in the figure. The center of the whole lens is the point of intersection of the two lines, but it is important for the due appreciation of certain problems connected with spectacles to recollect the condition of lateral and vertical deviation in other parts of the lens.

Fig. 4 shows another lens sph. + 2.00 cyl. - 3.00 ax. 60°. Here the cylindrical displacement is in the reverse direction, i.e., towards the axis. The locus of no horizontal deviation is found on the other side of the cylinder axis. Its position may be best estimated by resolving the oblique 3 diopter deviation into a 2 diopter horizontal and a 1 diopter vertical deviation. This is accurate enough for our purpose, as the axis is 60°, though not quite exact. Then the line of no vertical deviation will coincide with the minor axis of the oval, along which the normals to the cylinder axis and the major axis of the oval are in the ratio of 1 : 2. But we need not puzzle too much over these diagrams, because, as I intend to show you shortly, these lines of no deviation are easily found empirically, and with quite sufficient accuracy for spectacle work.

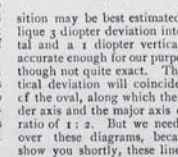


FIG. 4.

Having now illustrated what I mean by the center of a spectacle lens, I want to direct your attention to the consideration of spectacle lenses taken in pairs. I suppose we all of us, when talking loosely, use some such phrase as "the eyes should look through the centers of the lenses." The words convey the idea, perhaps, with sufficient accuracy for most purposes, of what we ought to aim at in spectacle fitting. But clearly it is not an exact expression. The eyes range over the whole of the lenses; and it would be more precise to say that spectacles should be so arranged that the eyes look through corresponding parts of the lenses, where the displacement, due to prismatic effect, is equal and in the same direction. Now, it is evident that these conditions are only possible, when the two lenses are of equal power, and, in the case of cylinders, in a similar position. When we come to consider the rule as applied to most cases of oblique astigmatism, or to cases of anisometropia, we are met with a difficulty.

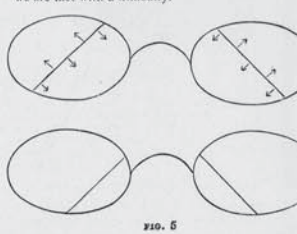


FIG. 5.

Let us take a simple case of oblique astigmatism. A pair of spectacles, as represented in the top diagram of Fig. 5, is fitted with lenses

R. cyl. + 1.00 axis 60°
L. cyl. + 1.00 axis 120°

If you look at the diagram you will see at once the difficulty that arises. The straight lines represent in each eye the center of the lens, or that part of the lens where there is no prismatic effect. The arrow heads show the direction of displacement, due in each lens to the cylindrical curve. There is only one possible position where displacement is equal and in the same direction, viz: when the eyes look through the geometrical center. If they look above, the centers are too narrow; if below, the centers are too wide; if they look to the right, the displacement of the right eye is obliquely upward, of the left obliquely downward; if they look to the left, the displacement of the right lens is obliquely downward, that of the left lens obliquely upward. It is important to note that this displacement increases as the part of the lens through which the eyes look is further from the center; and that its rate of increase is greater the deeper the curves of the lens.

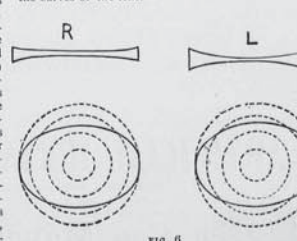


FIG. 6.

We can examine this better in dealing with our next case, a case of anisometropic myopia. Let us take the spectacles as

R. sph. - 2.00
L. sph. - 6.00

(Continued on page 827.)

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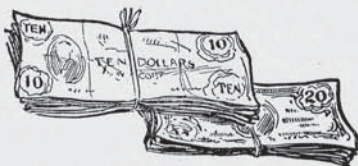
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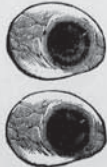
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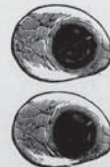
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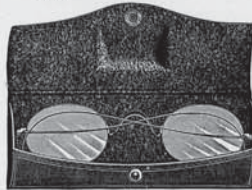
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The Centering of Spectacle Lenses.

(Continued from page 825.)

The diagram shows the spectacles in horizontal position and in plan. Here again you will see that the only part of the lenses when the displacement is equal is in the geometrical centers; for there in both lenses the displacement is $= 0$. Now I want you to see that in the weaker lens the prismatic formation to which the displacement is due is much less marked than in the stronger one; and also that while near the center the prismatic effect is slight, as we approach the margin it becomes much more marked. If we take four distances, 5, 10, 15 and 20 millimeters from the centers of the lenses, which distances are represented by the circles, we shall find that for the -2.00 lens the prismatic effect

at 5 mm. $= 35'$
10 " $= 1'9''$
15 " $= 1'43''$
20 " $= 2'18''$

while for the -6.00 lens it is

at 5 mm. $= 1'43'$
10 " $= 3'26'$
15 " $= 5'9''$
20 " $= 6'51''$

So that if the eyes be directed 5 mm. to the right, there is a deviation of the right line of sight of $35'$, and of the left of $1'43'$; while the respective deviations for the right and left lenses at a distance of 20 mm. from the centers are $2'18'$ and $6'51'$.

What is the remedy for this? Clearly there is no complete remedy. I have said elsewhere spectacles are always a compromise. Every possible pair of spectacles presents certain insurmountable difficulties. But mitigations are possible; and it is not the least fascinating part of the craft of the spectacle-maker to discover and apply these mitigations.

In the first place much may be done by judicious decentering. I hope later on to deal with some of the principles which may safely guide us. But look for a minute again at Fig. 5, and see what decentering will do for us here. As it is you will recollect that throughout the upper halves of the lenses the centers are too narrow and in the lower halves too wide. Now, suppose we decenter each lens 1 cm. inward, as in the lower diagram. The centers are now nowhere too wide. In parts certainly they are too narrow; but that, as I will explain later, is a lesser evil. That is an instance of what can be done by decentering.

Another method of mitigating the bad effects of unequal displacements is by using small glasses; preferably shallow shapes; *e. g.*, ovals with a short minor axis, or ovals with the top half cut off. By this means you abolish the greater differences of prismatic effect at the margins; and especially by the shallow shapes you reduce them in the direction where they are least tolerated. In this connection I would call your attention to the value of Franklin and bifocal spectacles, in which the lenses must necessarily assume this shallow shape. There are many different ways of combining the two lenses in Franklin spectacles, and they are all equally suitable to this purpose with one exception. I make an exception of the worked bifocal, where the two lenses are ground on the same piece of glass. This form of bifocal should never be used in cases of anisometropia such as we are considering, because it is impossible to work the glass with the centers in the middle of the lenses. The lenses are therefore what we may call marginal, and the differences of vertical prismatic effect are increased. Of course, these objections only apply to the special cases we are considering. In some cases the worked bifocal may be the best form of Franklin lens.

For the same reason care should be exercised in fitting cemented bifocals that the added lens is so centered and set as to neutralize the vertical prismatic effect due to its position on the margin of the large lens. This requires careful calculation and adjustment, and unless it is done the cemented bifocal is as unsuitable for these cases as the worked bifocal.

Of the many forms of Franklin spectacles, I myself give preference to the two separate lenses with a straight division between them; largely for the reason that there is then no difficulty in arranging the center in the middle of the vertical axis of each lens. Another advantage that attaches to this form is that it facilitates a difference in the width between the centers of the upper and lower halves; we shall see later on that this is generally desirable. I may add that a further point in its favor is that it permits the tilting of the lower lenses, which is a very important advantage, though the reason why it is so does not come properly into the present paper.

I want to take you back again (see Fig. 6) to the case of anisometropia, where the correction was

R. sph. -2.00
L. sph. -6.00

I called your attention before to the great difficulty that is involved in a pair of spectacles fitted with such lenses. The basis of the difficulty is the desire of the eyes to fuse the two images which they receive. This fusion occurs only when the images fall upon corresponding parts of the retina. The efforts of irregular convergence which the eyes make in order to ensure this effect are involuntary; they cannot be controlled; and in looking through spectacles such as these, these irregular efforts must be constantly exercised in all directions. For instance, as the eyes range from the center upwards, they pass first through an area, where the difference of displacement is very slight, and can be corrected perhaps with little inconvenience; at a distance of 10 mm. from the center the difference of displacement is equal to that which would result if a prism of $2'17'$ were held base up in front of the left eye. At 15 mm. the difference of prismatic effect is $3'26'$; strong eyes can still perhaps fuse the images, but the strain is so great that after a few seconds the muscles are over-tired and give way, with a result that the images separate. At 20 mm. fusion is no longer possible and diplopia supervenes. So much for one direction. It will be seen that if the eyes range down instead of up, the same efforts are necessary but in an opposite direction; while if they travel to the right they must unduly diverge, and if to the left, converge. Thus the whole gamut of strain is sounded, and the extreme effort of every muscle is more than demanded. I have been led to enlarge upon this subject, because I regard it as one of the most difficult problems with which we spectacle-makers are confronted. Many suggestions have been made for the treatment of these cases. Evidently the treatment must depend on considerations of the age, health and habits of the spectacle wearer; on the existence or non-existence of binocular impression, and so on; considerations which are certainly not germane to the subject of the present paper, and which, moreover, in my view, lie outside the proper province of the optician.

But I want to call your attention to a suggestion which I made some five years ago for treating such cases with what I have called concentric bifocals. I have already pointed out that the greater prismatic differences exist only in those parts of the lenses which are further removed from the centers. My proposal is to reduce the size of the stronger glass in myopia, or the weaker in hyperopia, so that the difference in prismatic effect at the extreme margin of the reduced lens and the corresponding part of the other lens does not exceed what can easily be corrected. Upon the remaining surface of the bifocal lens I propose to work the curve of the other lens.

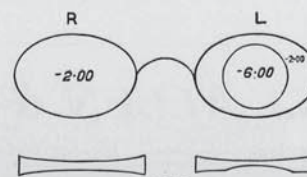


FIG. 7.

The figure which illustrates our case of anisometropia treated in this way explains my suggestion better than words. With spectacles so arranged, each eye being fully corrected, easy binocular sight is obtained through the central and effective part of the lenses; and if the sight is directed through

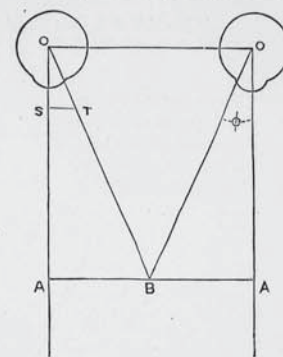


FIG. 8.

the marginal part of the lenses, there is at least no strain from difference of prismatic effect; both images, though only one is clear, falling naturally on corresponding parts of the retina.

This method has been tried and adopted with success by several oculists, and I venture to commend it to those of you who are bold enough to do your own refraction, as a safe way of dealing with these difficult cases.

As some relaxation before entering upon the second part of my paper, the effect of centering upon the conjugate movements of the eyes, I propose to demonstrate the different methods of finding and marking the centers of spectacle lenses.

1. By reflection.
2. By finding points of no horizontal, and of no vertical deviation.
3. The Maddox analyzer.
4. The Dixey prism.
5. A new centering instrument.

Perhaps it may be asked, why it is necessary to be so minutely particular about the centering of spectacle lenses. The eyes have an extensive power of adaptation, and so long as a rough accuracy is attained, will adjust themselves to any slight difference of displacement. And the answer is, that in these minute differences of displacement are often involved the whole difference between comfort and discomfort; between ease and pain, between a beneficial and injurious effect of the spectacle lenses upon the eyes. And what especially makes the matter worth studying is that in some directions a wide difference of displacement is allowable, and, indeed (as we shall see) desirable; while in other directions a very small difference of deviations is attended with pain and distress.

Now, in approaching the consideration of the pathological aspect of the conjugate movements of the eyes, we trench on difficult ground. I cannot leave it out of account in dealing with the centering of spectacle lenses; but I will say frankly that in many of the problems connected with the subject I have no conviction, nor have I the knowledge which I should consider necessary before giving a trustworthy opinion.

In such a case one generally turns to authority; but the authorities on this subject are notably barren. You will find in the text books plenty about normal movements, and something about abnormal movements, but, so far as I can discover, there is very little about the pathology of abnormal movements, as distinguished from morbid conditions.

(Continued on page 829.)

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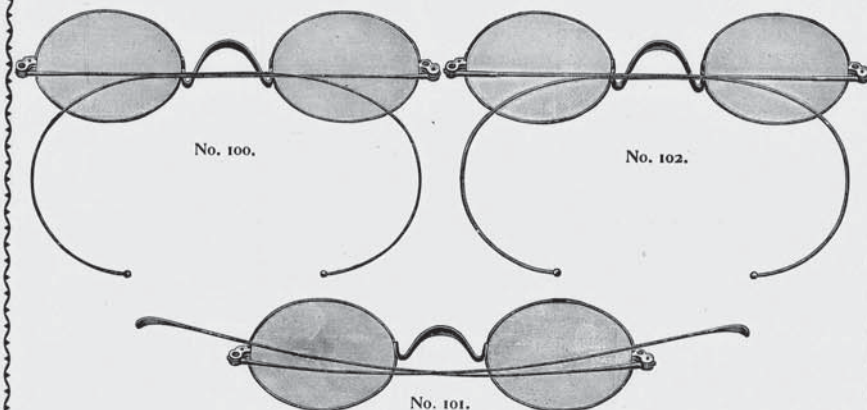
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The Centering of Spectacle Lenses.

(Continued from page 825.)

Nevertheless, there are certain propositions, I mean to lay four before you, which, based as they mainly are on common sense and common experience, I think we may conditionally accept as guides in our practical work of spectacle fitting.

But before I attempt to formulate these more or less debatable propositions, let us examine two or three points connected with the conjugate movements of the eyes which are merely matters of demonstration. Let us consider the conditions of normal convergence. Starting with the eyes at what we may call the position of rest; both eyes are directed to a point at infinite distance, the visual lines are parallel, and remain so, as the eyes turn about in their sockets; but only so long as the objects looked at are at an infinite distance; if a near object is looked at, the eyes turn inward, and the lines of sight converge. We have this represented in Fig. 8.

OO' represent the centers of rotation of the two eyes. The parallel lines OA OA' represent the visual lines when the object is at infinity. B is a near point at short reading distance, a quarter of a meter, to which the eyes converge along the lines OB O'B. We will take pupil distance at 60 mm.; then we have

$$AB = 30 \text{ mm.}$$

$$OB = 250 \text{ mm.}$$

and $\tan \phi$, the angle through which each eye turns in converging, $= \frac{30}{250} = .12$.

or, $\phi = 7^\circ$. It is evident then that each eye turns through an angle of 7° in converging to an object at ordinary reading distance. This is our first point, and is simply a quantitative statement of the normal exercise of the function of convergence.

The second point to which I would call your attention is illustrated by the same figure. In converging sight the distance between corresponding points on the visual lines varies inversely as their distance from the centers of rotation of the eyes.

This is a matter of great importance in its application to spectacle fitting. Spectacles that are arranged for use at a definite distance, as for reading, should always be centered with this condition of the visual lines in view; and it will be interesting on this account to arrive at some quantitative estimate of the amount of decentration required. The point S on the figure represents the position of the spectacle lens in front of the eye. Unfortunately, the distance of S from O cannot be measured. I take it in an average case as 20 mm. It must always be estimated. In extreme myopia it will be greater, in hyperopia, less; long lashes or a particular formation of the nose may increase it. But taking OS as 20 mm., we have

$$ST = 20 \tan \phi$$

$$= 20 \times .12 = 2.4$$

which gives us 4.8 mm. as the difference in centering between distance and reading spectacles. It is easy to confirm these figures, with the aid of what I call my gamma measure, which you will find on the table, and which anyone can make for himself. It consists of two disks with pinhole apertures pivoted together in such a way that the distance between the apertures is variable. Fixing the eyes on a distant object, hold the measure in the position of spectacles, and adjust the width till the two apertures appear to coincide; measure the distance between them; then repeat the experiment with the object at reading distance; and the figures will be verified.

We may, therefore, take it as an established rule for spectacle fitting that the centers of reading spectacles should be about 5 mm. narrower than the pupil centers when the eyes are fixed at distance; *i. e.*, if the pupil distance is measured as 60 mm., the reading spectacles should be centered 55 mm.

Now I want to call your attention to the next point, that centers can only be absolutely correct when spectacles are used at a definite distance. With spectacles for general use, as the eyes turn from one object to another, ranging over distances

of from six inches or so to infinity, the centers of the spectacles should also vary from 50 to 60 mm. For each distance between reading distance and infinity there is a corresponding value for the spectacle centers lying between 60 and 55 mm. Clearly, spectacle lenses cannot be made to correspond with these differences. We must either center the lens for distance, and be content to have them too wide for reading; or we must center them for reading, and have them too narrow for distance; or we must find a mean. The consideration of this problem forces us on to the more difficult ground of the pathology of convergence.

I have said that I mean to submit to you four propositions, which, in my opinion, may be accepted as safe guides in our practice of spectacle fitting; and my first proposition is that *wherever possible the normal relation between convergence and accommodation is to be maintained.*

To illustrate the application of this rule let us take a simple case of presbyopia, represented by the formula R. and L. sph. + 1.00. Now, in this case, before the intervention of presbyopia, normal relations between convergence and accommodation have prevailed. With the 7° of convergence necessary for reading has been exercised an accommodation of four diopters. But so soon as you give the + 1 spectacles, you reduce the necessary accommodative effort to three diopters. This degree of accommodation has previously been associated with a convergence of not 7° but $5\frac{1}{2}^\circ$. The spectacles should, therefore, be centered that the convergence at 250 mm. is reduced by $1\frac{1}{2}^\circ$. With convex lenses this means a decentering inwards in addition to the similar decentering due to the position of the spectacles on the visual lines. With concave lenses the allowance takes the form of an outward decentering, and it will be seen that it occurs in an opposite direction to the allowance for position on the visual lines, which it may either exactly neutralize, or over or under neutralize, according to the strength of the lens.

In cases of hyperopia and myopia when the same strength of lens is used for two distances, normal relation of convergence and accommodation may be maintained by the use of what I have called bicentric spectacles; *i. e.*, spectacles, each eye of which consists of two lenses as in bifocals, but with each lens so centered that among other things allowance is made for convergence.

I suggest this as a general rule, but it must be applied with discretion, as it is evidently subject to modification. In the case of an adult with a slight error of refraction, who has not habitually worn spectacles, it is clear that habit will have interfered with the normal relation between convergence and accommodation. Take the case of a myope of two diopters. He will have the habit of converging up to half a meter without exercise of his accommodation, and for reading at 250 mm. he will only require two diopters. Similarly a hyperope will accommodate without converging, and will require more than four diopters of accommodation in converging to 250 mm. In such cases a modification of the rule may be allowed, or how far this concession to habit should extend, or whether an effort should not be made to restore normal relations, are precisely questions on which I have no conviction. They may be further considered in connection with my third proposition.

My next proposition is that *artificial convergence induces accommodation.* There is no doubt of the converse, and in view of the close interrelation of the two functions, it seems possible to assume that either may be stimulated by the other. Whether this is so or not, our practice in centering spectacle lenses is not materially affected, because if the assumption is right, it would only confirm the rule, which may be briefly indicated as "convex in and concave out," for which we have already ample reasons; and if it is not right, it need not be considered, and our other reasons are not affected. But if we may assume that this proposition is correct, we can claim for the judicious application of the rule to the centering of spectacles an importance of great weight. It will be admitted that among the therapeutic properties of spectacles, one of the chief is to limit undue accommodation. It is clear that, if our propo-

sition holds, by reducing convergence we tend to check undue accommodation. Thus the practice we advocate for other reasons acquires additional value from the therapeutic point of view.

There remain two propositions which deal respectively with dissimilar deviations in a horizontal and in a vertical direction; and my third proposition dealing with horizontal deviations is that *slight divergence is not painful or injurious, but excess of convergence is injurious and to be avoided.* I can give you no reasons without getting beyond my depth. But I do not think that the proposition will be questioned by anyone with practical experience. I have already demonstrated the extent of normal convergence, which amounts to 14° taking the two eyes together at an ordinary reading distance; and on the point of the injurious effect of excessive convergence authority speaks very clearly. Slight divergence may I think safely be defined as 1° for each eye. I do not think this should be exceeded unless the nature of the lens demand it. Referring back then to the problem which I left unanswered, how to center lenses which are intended for general use; we are in a position to lay down that the lines of sight must never at a working distance pass through the diverging parts of the lens, *i. e.*, through both nasal sides of convex, or both temporal sides of concave lenses, while, if the nature of the lenses demand it, the lenses may be so centered that for distant sight the visual lines may pass through the converging parts of the lenses, provided always that the prismatic effect does not exceed 1° for each eye. This you will see is a further confirmation of our rule, convex in, concave out.

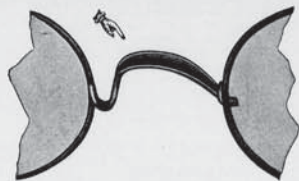
The fourth and last proposition on the subject of conjugate movements is that *difference of vertical deviations is painful and injurious; and is by all possible means to be avoided.* This again is a proposition which will assuredly not be questioned by any one with experience, and in its application to spectacle work, is of the first importance. When the lenses allow, the centers should be set with the nicest accuracy, so that vertical displacements are similar in corresponding parts of the lenses. Frames should be designed so as to sit straight, as it is evident that with nearly all lenses the slightest degree of obliquity in the position of spectacles or eye-glasses will cause difference in the vertical deviations. In those cases where the nature of the lenses prevents similarity of vertical deviation, every possible means should be adopted for limiting the differences. I have already made certain suggestions in this respect, and others will be found in the text books.

In considering these problems connected with the conjugate movements of the eyes it has been my endeavor to confine myself to that part of the subject which is associated with the centering of spectacle lenses. Questions of muscular insufficiency, all the phorias and the tropias lie outside the subject of the paper as I conceive it. Nor have I any object but to put before you, as clearly and exactly as I can, those qualities of lenses, and those conditions of the conjugate movements of the eyes which should be, and indeed more or less must be, in our minds whenever we sit down to consider where we shall put the centers of our spectacle lenses. This clearly lies within the province of the optician. But we must distinguish between these necessary and desirable adjustments of the centers, and adjustments that may be said to involve treatment. As I have tried to emphasize; whatever general rules we make, in adapting them to individual cases there are many considerations involved, the right decision of which demands medical knowledge and experience. I think we opticians will best fulfill our functions if we confine ourselves to suggesting the possibilities of lenses in their different forms and adjustment, and so far as our practical work goes, if we limit ourselves to the observance of the obvious conditions which it has been the object of this paper to indicate.

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Minnesota Optical Association.

A meeting called for the purpose of effecting a permanent organization of a State optical society was held at the Hotel Ryan, Minneapolis, May 25th. The meeting was called to order by S. B. Millard, temporary president. The call and object of the society was read by Chas. A. Hoffman, temporary secretary. Committee on by-laws and constitution reported a draft of same and asked its approval by the convention. The constitution was read and adopted. The by-laws were read and after some amendments were adopted. The committee were then discharged with thanks.

The following permanent officers were then elected: President, Samuel B. Millard, Litchfield; first vice-president, Geo. P. Tuthill, St. Paul; second vice-president, H. M. Hitchcock, Redwood Falls; treasurer, Chas. A. Hoffman, Minneapolis; secretary, C. A. Snell, 608 Nicollet Avenue, Minneapolis. Directors: Frank A. Upham, St. Paul, four years; I. Sheridan, St. Charles, three years; J. K. Martin, Minneapolis, two years; J. C. Herdlika, Princeton, one year.

The following signed the constitution and by-laws and were made charter members on payment of the prescribed initiation fees and yearly dues: Wm. P. Knauer, C. A. Snell, J. M. Neese, S. W. Thomas, E. W. Kittredge, E. E. Ostrum, Rueben L. Magnus, L. J. Korstad, Ada M. Peit, Clara L. Peit, Nathan Gambiner, Louis Koch, Arthur E. Smith, J. J. Dowd, E. D. Best, F. W. Estabrook, J. H. Masher, J. N. Nelson, J. A. Worrell, Chas. A. Hoffman, J. K. Martin, Minneapolis, Frank Heitman, Dr. C. T. Miller, Geo. P. Tuthill, Frank A. Upham, of St. Paul; S. B. Millard, Litchfield; I. Sheridan, St. Charles; L. H. Brunns, Anoka; B. W. Brown, Morris; J. C. Herdlika, Princeton; E. S. Houghton, Cannon Falls; Fred. H. Stranh, Fergus Falls; H. M. Hitchcock, Redwood Falls; Chas. C. Staacke, St. Croix Falls (Wis.); Emil Hulmer, Stillwater.

The secretary had several letters from parties wishing to become charter members. He was instructed to notify them that by sending in the required fees they would be accepted.

The next meeting will be held in Minneapolis during State Fair week, the first week in September. After several speeches by different members for the good of the order, the meeting adjourned.

Sketch of the Officers.

S. B. Millard has the honor of being the first president of the Minnesota Optical Association, having been elected unanimously. While a young man (he being born in 1869, at Three Rivers, Mich.), he has for a number of years been one of the most progressive opticians in the State. He established his present business in Litchfield, Minn., in 1891, since which he has left no stone unturned to make it a success. While not given to making a great ado about his giving instructions to those wishing to study optics, he has probably had more successful students than anyone else in the Northwest. Mr. Millard is not only an optician that can fit the eye, but also a practical workman, doing his own grinding and frame fitting. As in most of our smaller cities, he also has, in connection with his optical business, one of the best-equipped jewelry stores in this section. Mr. Millard believes in keeping up with the times in all things, and likes to take a post graduate course whenever opportunity offers, his last being a course with L. L. Ferguson, in 1899.

Geo. P. Tuthill, St. Paul, first vice-president, was born at Clinton, Iowa, in 1858; graduated from the Chicago Ophthalmic College in June, 1888; worked as refracting optician at Sioux Falls, S. Dak., from that time until June 1, 1895, when he began his present business at 125 Endicott Arcade, St. Paul. Mr. Tuthill now makes a specialty of adapting, having a large practice, doing his

own grinding and frame work, devoting his entire time to this work. He also is a charter member of the American Association of Opticians.

H. M. Hitchcock, Redwood Falls, second vice-president, was born in 1859, at Waterville, Minn.; started to learn the drug business in Redwood Falls in 1885, since which time he has continually been in that city. He is a graduate of the Chicago Ophthalmic College, class of 1893, being the first resident graduate optician in Southwest Minnesota. He believes the optical and drug combination a very good one.

Charles A. Hoffman, Minneapolis, treasurer, was born in Pittsburg, Pa., June 6, 1855. He went to work as an apprentice with Louis Boerling, the optician, in Chicago, in the fall of 1869 and staid in his employ until October, 1883, when he came to Minneapolis and opened a small optical store. This soon was too small, and in less than a year he moved to 257 Nicollet Avenue, where he remained for two years, when the quarters became inadequate for the growing business and he had the stores No. 20 and 22 South Fourth Street built for him. In this he prospered, and soon had the double store and the basement and the whole second floor. Business then drifted towards Nicollet Avenue and he went with it, securing a store at 521 Nicollet Avenue. After his lease expired he

given his exclusive attention ever since. Mr. Snell is a thorough optician, both refracting and dispensing; and, besides this, has taught a large number of students from this section both the theoretical and practical parts of the optical business. As secretary, he will undoubtedly prove the right man in the right place, as his "push" is what is needed to make the association a success.

Frank A. Upham, St. Paul, chairman of board of directors, was born at St. Cloud, Minn., in 1860; began the jewelry business in St. Paul, 1880; began the optical business in St. Paul, 1886; is a graduate of McCormick Optical College and L. L. Ferguson. He is the founder of the Northwestern College of Optics and his students have shown themselves capable of handling the most difficult cases. He can also claim to be one of the originators, if not the originator, of the Minnesota Optical Association, being one of the most enthusiastic members of the association. His experience attending meetings of Eastern associations will be of great benefit to us here.

I. Sheridan, St. Charles, member of board of directors, was born in 1866 near Trenton, N. J.; came to Minnesota in 1878; began to learn the jewelry business in 1883; located in St. Charles in 1888; began to study optics in 1893, and in 1898 graduated from the McCormick Optical College. Mr. Sheridan has been very successful in business, carrying a nice stock of goods. He owns his own store-building on one of the principal corners of his town and has the confidence and good will of his townspeople.

J. C. Herdlika, Princeton, of the board of directors, was born in 1862 in Austria, Europe; came to Minnesota in 1864; received his first business training in Owatonna, Minn.; came to Princeton in 1888, and started in the jewelry business there for himself in 1897; graduated from Upham's Optical School in 1900. Mr. Herdlika has been very successful in his business career, being a close student of whatever he has undertaken; is young and progressive and will make an earnest and honest member of the board of management.

This organization was launched under the happiest auspices, and a successful future would seem to be assured for it. That it is an up-to-date society will be seen by reference to the illustrations on page 835, of two attractive charter members.

Iowa Optical Society.

The Iowa State Optical Association made a fine showing at its last annual meeting. The secretary's report showed that twenty-six members had been added to the membership the past year, making a total now on the roll of seventy-four; and lively interest was shown in all matters brought before the society. The treasurer's report showed a nice balance on hand after all expenses had been met. The leading wholesale houses of Chicago thought the meeting important enough to send special representatives, who exhibited instruments handled by these concerns. The question box was a very interesting feature of the meeting and brought forth much pleasant and profitable discussion. The members who attended were much gratified by the cordial reception they received from the local opticians and jewelers, and unanimously agreed that Des Moines was a first-class convention city and a good place to meet. Much credit for the success of the meeting was due to the bright and energetic officers of the association.

A Call to Tennessee Opticians.

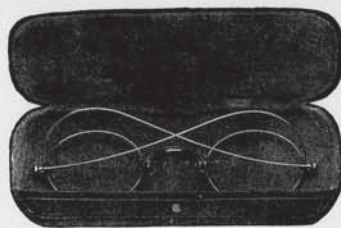
Opticians in Tennessee who are desirous of effecting a State organization are invited to correspond with L. T. Little, of Union City, Tenn., who is willing to do anything in his power to help organize a State society. Every State in the Union should have an organization, and we trust there will be a hearty response from Tennessee and that we may have the pleasure, in the near future, of adding this State to the growing list of State societies.

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Optical Organizations.

American Association of Opticians.

OMAR LEMKE, President, New York City.
C. A. LONGWORTH, Treasurer, Philadelphia, Pa.
F. BOONE, Secretary, 26 Maiden Lane, New York City.
Meets annually. Next meeting to be held August 14, 15 and 16, 1901, in Detroit, Mich.

New England Association of Opticians.

C. N. QUINCY, President, Boston, Mass.
W. L. THOMAS, Treasurer, Boston, Mass.
W. R. DORRIS, Secretary, 4 Province Court, Boston, Mass.
Meets third Tuesday of each month, except July and August.

New York State Association of Opticians.

JAMES HUBBARD, President, Syracuse, N. Y.
C. E. HUBBARD, Treasurer, Palisades, N. Y.
A. W. LORAIN, Secretary, Seneca Falls, N. Y.
Meets bi-monthly (second Wednesday).

New York State Optical Society.

F. L. SWARTY, President, Auburn, N. Y.
E. F. CLARK, Vice President, Utica, N. Y.
F. E. ROBERTS, Treasurer, Elmira, N. Y.
F. E. MARCHANT, Sec'y, 30 Fairbairn Ave., Brooklyn, N. Y.

Pennsylvania Optical Society.

A. MARVIN, President, Philadelphia, Pa.
E. K. LARSEN, Treasurer, Philadelphia, Pa.
C. A. LONGWORTH, Secretary, 221 Market St., Phila., Pa.
Annual meeting, Tuesday, September 26, 1900.

Michigan Optical Society.

NELSON K. STANBARD, President, Detroit, Mich.
F. SCHILLER, Vice President, Lake Linden, U. P., Mich.
E. EMMER, Sec. and Treas., 1000 Western Ave., Muskegon, Mich.

Iowa Optical Society.

H. P. HOLMES, President, Des Moines, Iowa.
F. J. LARSEN, Vice President, Glenwood, Iowa.
J. C. CLARK, Secretary, 309 Bowen Block, Sioux City, Iowa.

Illinois Optical Society.

WALTER WYATT, President, Peoria, Ill.
W. L. NORMAN, Treasurer, 101 State St., Chicago, Ill.
A. R. CHANDLER, Secretary, Aurora, Ill.
L. L. BRYAN, Assistant Secretary, 309 State St., Chicago, Ill.

Maryland Optical Society.

F. W. McALLISTER, President, Baltimore, Md.
H. H. BRANDY, Treasurer, Baltimore, Md.
W. H. KETTLER, Sec'y, 100 W. Lexington St., Baltimore, Md.
Meets at rooms of Photographic Association, Baltimore, Md.

California Association.

R. BENT MAJOR, President, San Jose, Cal.
S. G. BLANCHETT, First Vice President, Los Angeles, Cal.
H. HUNT, Treasurer, San Jose, Cal.
G. L. SCHWAB, Secretary, Stockton, Cal.

Oregon Association of Opticians.

I. O. WATTS, President, Eugene, Ore.
W. E. GARDNER, Treasurer, The Dalles, Oregon.
C. L. HAYDEN, Secretary, Portland, Oregon.

Washington Association of Opticians.

H. CLAY EVERSOLE, President, Seattle, Wash.
CHAS. G. HOLCOMB, Treasurer, Seattle, Wash.
H. L. KIRBY, Secretary, Spokane, Wash.

Granite State Optical Association.

GEO. H. BROWN, President, Manchester, N. H.
W. L. FLETCHER, Treasurer, Concord, N. H.
J. A. CARPENTER, Sec'y, 90 Elm St., Manchester, N. H.
Meets second Tuesday of January, March, June, September and November.

Wisconsin State Optical Society.

ALICE SMITH, President, Beloit, Wis.
ADAM THOMAS, Vice President, Mineral Point, Wis.
FRANK C. HYER, Treasurer, Appleton, Wis.
WALTER H. GUNDEL, Secretary, Green Bay, Wis.
Meets semi-annually. Next meeting, January, 1901, in Oshkosh.

North Carolina Optical Society.

S. R. PECK, President, Charlotte.
W. F. HENDERSON, Vice President, Taylorsville.
W. MARLAP, Treasurer, Raleigh.
W. H. LAWSON, Secretary, Winston, N. C.
Next meeting, Greensboro, August 19th and 20th.

Minnesota Optical Association.

S. H. MELLAND, President, Lincoln, Minn.
CHAS. A. HEPBURN, Treas., 101 N. Minneapolis, Minn.
C. A. NIELSEN, Secretary, 101 N. Minneapolis, Minn.
Next meeting, September 6, 1900, in Minneapolis.

New York City Optical Society.

F. A. DELMONT, President.
F. A. WOLF, Treasurer.
M. H. HARRIS, Sec. Sec., 147 W. 23d St., New York City.
Meets second Wednesday of each month at Fifth Avenue Hotel.

Rochester Optical Club.

R. E. BAKER, President.
W. W. HENSLER, Treasurer.
R. E. BAKER, Secretary, Chamber of Commerce Building, Rochester, N. Y.

The American Association.

It is understood that at the meeting of the American Association of Opticians, to be held at Detroit a few days hence, an effort will be made to enunciate a standard for the practice of optometry in this country. If the effort is made we trust the authors will confine it within limits that will save it from the charge of assumption. We regret that there must needs be such limitations in such a laudable endeavor, especially as there are men of sufficient ability in the membership to frame a proper standard. The fact must not be forgotten, however, that this association is a trades organization, not a scientific society, as we would like to see it. It must be radically altered before it can claim to representatively speak for the great body of American opticians. In the first place, a membership made up of manufacturers, wholesalers and tradesmen of all sorts, along with opticians proper, is not the one to establish a scientific standard for a profession. The object of the association, as stated by its constitution, is for "the advancement of the optical trade in all its branches," and not for "the advancement of the science of optics," as the committee of able opticians who drafted the instrument reported. This change in the fundamental constitution of the organization should never have been perpetrated, and would not have if those interested had been more faithful and alert in their attendance of the first meeting of the new association. The change was made at a meeting attended by a score or so out of a membership of between two and three hundred. And when later the majority awoke to the fact that it had been outgeneraled, it did not have the courage to rectify the wrong. In keeping with the trade aspect and mould of the new society, naturally the membership was made broad enough to take in anyone in any way connected with the trade. Before this association should attempt to promulgate a scientific standard, it should rectify its constitution and restrict its membership to those who are properly entitled to be called opticians. Until this is done, the most this association can do, with propriety, is to put itself on record as favoring the adoption of a standard and pledging itself to support the establishing of the same in every way consistent to its heterogeneous membership and broad constitution. At the present time the only bodies qualified in any measure to set up a standard in this country are the various optical societies, whose constitutions declare them to be scientific bodies and whose membership are fairly representative of the opticians of the country.

In this connection we wish also to refer to another proposal for consideration at the forthcoming meeting, which is, that an effort should be made to consolidate the various State societies with this association. As these societies are all organized on a higher basis than this association, such a movement would be a step backward. And it is for this reason also that this association should become a scientific body and purge its active membership of the tradesmen. This class already members, could, we believe, without objection, be easily changed into associate members, with restricted privileges. Most of them have joined merely out of sympathy and a desire to help the cause and who would be satisfied to either drop out, if this is desirable, or if the association still needs their support, to remain as contributing or associate members. This would also eliminate those whose aim in connecting themselves with the association has been mainly

for personal advantage. The growth and harmony of the association has been greatly hindered by certain of this class. There should be sufficient high-minded opticians, sincere in their interest of their calling and the association, to aspire for the several offices that are to be filled, and the man with something to boom sent to the rear. The association can, properly organized and guided, do a great and constantly-increasing work, and it is to be sincerely hoped that the coming meeting will differ from the former ones and put the association in line to render the service the opportunity presents.

American Association.

We give below the programme of the meeting of the association, to be held at Detroit on the 14th, 15th and 16th of this month, as finally adopted. At this writing we have not been informed of the names of those who will open the discussion on the several topics provided in the scientific part of the programme.



Ernest Enner.

Mr. Enner is an optician, of Muskegon, Mich., and is responsible for the association meeting at Detroit, as his convincing and eloquent speech at Rochester, last year, won the meeting for the city he named. He was then elected a director of the association and he has been uniting in his efforts during the last year to make the coming meeting a big success. Mr. Enner is also secretary and treasurer of the new Michigan State Optical Society, as he was of the old society, and his efficient work in these positions, especially that of secretary, have led his friends to the belief that he would make an admirable secretary for the American Association. He writes a fine account of his meetings and is a hard worker, the chief requisite of a good secretary.

Tuesday, August 14th.

- 9 A.M. Opening of Exhibition Hall. Registration of members.
- 10 A.M. Convention called to order by the President.
- 10:30. Invocation.
- 11:00. Address of welcome.
- 12:00. Response by the President and President's Annual Address.
- 2:30. Report of Treasurer. Appointment of Auditing Committee.
- 2:45. Secretary's Annual Report.
- 2:50. Report of Executive Committee. Report of Committee on Membership.
- 3:00. Report of Committee on Education. The Committee will offer the following resolutions: * * *
- 3:20. Reports of other standing committees.
- 3:30. Scientific Session. Papers to be read by notable members, and each paper will be followed by an open discussion.
- 8:30. Reception to the visiting delegates and their ladies.

Wednesday, August 15th.

- 9 A.M. Open discussion of the following subjects: "Hypometropia Myopia and Astigmatism Objectively and Subjectively"; discussion opened by Mr. ———.
- "Presbyopia"; discussion opened by Mr. ———.
- "Muscular Anomalies"; discussion opened by Mr. ———.
- "Frame Fitting"; discussion opened by Mr. ———.
- After the discussions are opened the speakers are to be limited to five minutes each.
- 11:00. State Rally. Presided over by State President. Each State will arrange its own programme for this hour. All delegates in attendance not having a State organization will meet together and talk over advantages for such an organization.
- 2 P.M. Trolley ride to Water Works and visit to Parke, Davis & Co.'s Laboratories, boat ride to Belle Isle Park.
- 8:30. Banquet. This will be a very democratic and, it is hoped, successful affair. Several prominent orators will be the guests of the evening. Tickets to the banquet will be about \$1.50 each.

(Continued on page 837.)

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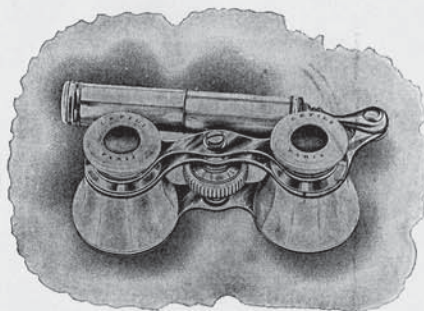
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New England Optical Institute.

The annual meeting of the corporation of the New England Optical Institute was held in Boston, July 16th, and several important changes were made in the corporation and plans for the coming year's work. It was decided to increase the number of trustees from nine to twenty-seven. The new members elected to the board include prominent men throughout New England, who are not opticians, but whose names are calculated to carry weight with the members of the State Legislature, when the institute goes before it for authority to grant diplomas to its graduates. When acceptances are in from the newly-elected trustees, another meeting will be held, when it is planned to elect Dr. W. A. Earle, instructor of ophthalmology in the institute, as president of the corporation and institute as successor to John W. Sanborn, who declines a re-election. F. E. Margot was re-elected treasurer and C. D. Tucker secretary.

At the next meeting new quarters for the institute will probably be selected, a committee meanwhile seeking desirable locations. It is planned to hold dry classes, and not confine them to the evening, as formerly. Also to extend the course of studies.

The newly-elected trustees were: Dr. William A. Earle, Boston; Geo. W. Wells, president of American Optical Co., Southbridge; Hon. W. W. Davis, Boston; John Petrus, Jr., Boston; Hon. William B. Durant, Cambridge; Alexis E. Frye, Havana, Cuba; Hon. Frank W. Rollins, Concord, N. H.; C. S. Cook, Boston; Hon. John Shaw, Quincy, L. V.; Rollins, Boston; David C. Percival, Boston; Eugene H. Cox, Malden; Hon. F. W. Dallinger, Cambridge; Benjamin V. Howe, Boston; Hon. J. F. Safford, Farmington, N. H.; George A. Barron, Boston; William E. Hicks, Lowell; William R. Dunovan, Boston; Frederick E. Margot, Boston. The terms of six members of the old board are unexpired, as follows: John W. Sanborn, Boston; Geo. H. Brown, Manchester, N. H.; Albert G. Barber, Boston; Briggs S. Palmer, Boston; Wm. C. Berry, Boston; Charles D. Tucker, Medford. With such a formidable board of directors the institute should make rapid progress.

New York State Association of Opticians.

The midsummer meeting of the New York State Association of Opticians was held Wednesday, July 12th, at the Yates Hotel, Syracuse. President Holden called the meeting to order at 3.30 p. m. Ordinary routine business followed, and Wayne O. Conger, of Syracuse, and G. Pierson Bell, of Waterloo, were elected to membership. A letter from P. W. Townner, of Waverly, requesting full particulars regarding membership in the association, was read by the secretary. A communication was also received from G. W. Lawrie, of Detroit, Mich., desiring a copy of the constitution of the association, the wholesale and retail jewelers of that city having decided to organize.

G. N. Luckey, of Baldwinville; F. L. Swart, of Auburn, and A. W. Golder, of Seneca Falls, were appointed a committee to draft resolutions of condolence on the recent death of J. B. Barnes, of Corning, who had been a member of the association since its organization.

A very interesting and instructive paper on "Asthenopia," by F. E. Robbins, of Elmira, was then read, treated his subject very thoroughly, giving the symptoms of muscular asthenopia and his methods for detecting and correcting it. He said: "As a rule, in giving prizes I prescribe on a basis of the least amount of muscular weakness shown, because I believe that that is the amount of insufficiency and that the surplus over that amount represents the fatigue due to overtaxing those weak muscles. I do not believe prizes should be prescribed in all cases of weak muscles. About one case

in ten of muscular insufficiency should have prismatic assistance. In a majority of cases, when the error of refraction is considerable and not a great amount of insufficiency exists, a correction of the refractive error will usually give the patient relief from the asthenic symptoms. I might give a great many cases where asthenic symptoms were present and where relief has been given in one or more of the following treatments which I have employed, namely: correcting the refraction, relieving the weak muscles by wearing prisms, or by exercising the weak muscles to bring them up to a normal standard. I can give no rule as to which treatment should be resorted to in any particular case, but use the best judgment that I am capable of and avoid prescribing prisms if it is possible to do so; more especially in young persons, and I always give as weak a prism as I believe will give the required relief. Thereby give the weak muscles a chance to recover themselves if possible, which they would not do if all the prism were crowded on that they could stand."

"What Are We Going to Do About It?" was the title of a paper by G. N. Luckey, of Baldwinville. Among the many other good things, Mr. Luckey said: "Our future is in our own hands and as our experience is limited regarding the way and manner in which we should handle the problem that does and will confront us, I think it wise



Two Lady Members of
Missouri Society.
The Missouri
organization secured a
small, charming
reception to the two lady
members whose portraits
are here shown, and an
invitation to membership
has been extended to other
lady opticians in the
State. The number of
lady opticians is increasing
yearly, and as there
are no more enthusiastic
members of the profes-
sion, their affiliation with
the various organizations
is more desirable.

Mrs. Ada M. Petri.

Miss Clara L. Petri.

that we follow the most competent leadership that we can find. At the present time we are without a leader. Every optician has an idea of his own as to how the great mass of opticians should act for their future welfare, but a few thousand ideas distributed among as many individuals is not going to do the work. It is true, we have our organizations, and they are good; they are the beginning of the result, but not the end. As you know, we approach the line of the medical men about as close as any established organization; so much so, that we seem to come in contact with them at various points in our work. We also know that they are one of the strongest societies of any class—bonded together with their legislative recognition. Their code of ethics, their medical societies, their adherence one to another and the high character they hold, have come about by years of study, by accepting the best ideas, by sifting out all that did not work for the best interests of the public whom they serve, and also for their own education. Now, I ask you in all candor, if that is not the best thing for us to do—follow as much as possible the lines along which they travel, and take pattern from them?"

Mr. Luckey urged opticians to put all energy and study into finding out all it is possible to know regarding hypermetropia, myopia, astigmatism and presbyopia, together with a negative study, to know what to let alone. In closing, he said: "Let us keep our eyes and minds on the old, tried lines that the doctors are pursuing, applying everything that will fit our profession, and, after we find out what we are, stick our stakes and positively as well as negatively hold fast that which is good, discard that which is not for our interests, avoiding all petty disturbances and strive for that goal to which we all have a dim vision that will grow brighter as we advance toward the culmination of our anticipations."

A resolution, which was offered by F. L. Swart, that the president be empowered to appoint a bureau of examination to investigate the qualifications and general standing

of applicants for admission to membership in the association, will receive consideration at the next session.

The financial secretary being absent on an extended Western sojourn, it was ordered that all books and papers in the hands of the financial secretary be turned over to the care of Treasurer Hibbard. The association then adjourned to meet in September.

California Optical Society.

The California Association of Opticians had their quarterly meeting in O. C. F. Hall, Alcazar Building, San Francisco, on the evening of July 16th, and while the attendance was not half had in that it might have been worse, still the clan did not turn out as was expected. Indeed, it was very discouraging to those who are giving up their time and talents towards the betterment of the conditions as they exist in the optical trade out the Slope, and it does seem as if those who are willing to share in the good to be obtained should be just as willing to do a little of the work. Don't sit down with your hands folded and baste the evils and abuses existing; get to work, and if you feel you cannot do much, remember that you can at least attend the quarterly meetings. Sending in your dues regularly is not enough. If you want the association—your association—to succeed, you must give it the light of your countenance and the seal of your approval. Don't forget nor overlook this. You stay-at-homes, turn out, attend the meeting, applaud the speeches, get a move on yourselves, and you will be surprised how much pleasure you will receive out of it, while the good you will be doing the craft can hardly be measured.

The meeting was called to order at 8 o'clock sharp, with R. Bruce Magee in the chair. Other officers present being W. H. Hunt, treasurer, and G. L. Schneider, secretary. Absentees, First Vice-President S. G. Marshate and Second Vice-President J. W. Davis. The minutes of the last meeting were read and approved as corrected. The committee of laws now reads John H.

Drumgold, John Renner and A. J. Schohay. The treasurer reported \$109.56 in the treasury. The secretary reported 79 members in good standing. A good showing for such a young society.

J. W. Foster, San Jose, who was asked to write a paper to be read at the July meeting, asked to be excused and pleaded too much business. A. J. Schohay read a humorous paper, entitled "The Woes of a Census Enumerator," in which he clearly demonstrated that unless the census takers were emmetropic their work could never be satisfactory to Uncle Sam.

The American Association of Opticians kindly extended an invitation to the California Association of Opticians to send delegates to the August meeting, to be held in Detroit.

On motion of G. L. Schneider, carried, the board of directors were empowered to provide attraction and entertainment for each succeeding meeting, including banquet and bay excursions, etc., so that besides instruction, visiting members may be assured of a good time generally, with plenty to see, much to eat and a pleasant memory to take away with them of meetings past and of those to come. So that in future you present stay-at-homes will have to come early if you want a front seat. It was announced that at the fall meeting will begin a series of lectures, illustrated by stereoscopic views, which no one can afford to miss.

Those who were not at this midsummer meeting missed the very able papers on "Extreme Myopia" and "False Myopia," read by Kuttner and Renner respectively, and the lectures of Mendelsohn and Drumgold, on "Scotoma" and "Cycloplegia"; and it is perhaps also but right to state that they missed the exceedingly straight-from-the-shoulder talk of Bruce Magee, who put the duties of the members before them in a way there was no mistaking. This association is fast becoming like the

(Continued on page 837.)

Views on Accommodation.

KNOXVILLE, TENN., June 18, 1900.

DEAR KEYSTONE:—In none of the extensive list of books treating of eye-refraction read by me, and in none of the lectures I have heard during my college work, have I had an "injection" of the subject here presented. As a contradiction of the well known physical axiom, "Two bodies cannot occupy the same space at the same time," is involved, I wonder it has not at least been touched upon in some of the optical journals (some of which I peruse with more pleasure and profit than THE KEYSTONE).

That the accommodation of the eye is largely due to an increase in bulk of the crystalline lens when its anterior surface has moved forward and become more convex, needs no proofs. What then takes place with the media involved? I assume, first, that the posterior sclerotic coat, reinforced by and filled out with the vitreous, is like the breech block of a gun, resisting any backward displacement. The only alternatives then are, a violation of the physical law referred to, or a forward movement of the "chamber" impelled by the forward movement of the crystalline during the act of accommodation. If the latter be true, it remains to be seen what further changes must necessarily follow.

My theory is that the aqueous is compressed somewhat, causing greater density and therefore greater refraction, and the cornea is also moved forward slightly, adding something to the refractive power of the eye as a whole; but factors thus assisting in the accommodative process.

If this theory is correct, it opens a new field for investigation, with a possibility of important results in presbyopia through mechanical means as well as through treatment involving eye nutrition.

Many refractionists will testify that their record books contain a history of presbyopic cases in which the amplitude of accommodation is far beyond the normal, and which cannot be accounted for by the presence of incipient senile cataract. Will the above theory throw any light on such cases?

H. J. COOK.

Our esteemed correspondent here assumes "that the accommodation of the eye is largely due to an increase in bulk of the crystalline lens" and that this increase produces a compression and greater optical density of the aqueous and a slight advancement of the cornea. Now it is evident that increased density of the aqueous and a slight forward movement of the cornea will increase the refractive power of the eye. Thus, in the July KEYSTONE of last year, we mentioned the researches of Dr. Hess, of Germany, who had shown that an increase of the index of the aqueous from 1.3365 to that of the cornea 1.377 would produce a myopia—but only of 1.7 diopters. We see, therefore, what little increase in the refractive power of the eye might be expected by the slight increase of density due to accommodation. But, is there such an increase of density and tension during the act of accommodation? According to the observations of Foerster (1864) the tension is

even diminished during accommodation; for he found that in patients in whom he had performed paracentesis of the cornea and in whom therefore cornea and iris were adjacent, the cornea became depressed the moment the patients accommodated. To assume, therefore, that the aqueous is compressed and the cornea is driven forward in accommodation, is, to say the least, very problematical in the light of these observations.

Indeed, even the increase in bulk of the crystalline is very doubtful, according to the researches of Tscherning, and even if it exists, does not exceed the limit of an error of observation. It seems most probable that only a change in the curvature of lens surfaces will explain all the facts.

But if such is the case, then the whole theory of our correspondent breaks down, not because it is wrong in itself, but because the assumed underlying facts have no reality.

With regard to the observation that many a presbyopic patient has an "amplitude of accommodation far beyond the normal," the reviewer would like to remark that most of these cases are to be explained by the smallness of the pupil, so prevalent in advancing years. This smallness of the pupil, either acquired by age or artificially produced by narrowing of the opening between the lids, reduces the circles of diffusion and allows to be read print which really lies within the near point of the eye.

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to be change brings you one display card of Photo Buttons.

American Association.

(Continued from page 832.)

Thursday, August 16th.

- 9 A.M. Business meeting and final session of the Convention. Called to order by the President.
- 9:05. Open parliament on the resolutions offered. First, by the Committees in their order: the Executive, Membership, Education, Ways and Means, Rules and Regulations Exhibits. Second, by the Officers in their order: the President, First Vice-President, Second Vice-President, Treasurer, Secretary.
- Third, by the members as recognized by the chair.
- 10:30. Nominations and election of President, First Vice-President, Second Vice-President, Treasurer, Secretary, Executive Committee.
- 11:00. Selection of next place of meeting. Adjournment.
- 12:30 P. M. Excursion on Detroit River.
- 7:30. Lecture on "Light," illustrated by the stereopticon, by Professor Charles Barnard. This lecture will be free to all members of the Association and their friends.

President Lemke has issued an address to all opticians, calling attention to the advantages of joining the association and attending the coming session. Regarding rates, he says:

"About all the passenger railroads have granted a reduction in railroad fares, equivalent to a third reduction, to obtain which you merely have to get a certificate from your local ticket agent, buy a full-fare ticket to Detroit, and present your certificate to our secretary at the convention hall sometime on Wednesday, the 16th of August. This certificate, when properly endorsed by our secretary on that day, entitles you to get your return ticket at about one-third of the full fare. There are a few other particulars about this matter which it would be well for you to carefully look into if you have never traveled under this form of reduced railway fares, as any omission or carelessness on the part of the delegate sometimes loses for him his opportunity of reduction."

The inducements furnished in the programme and railroad rates, added to the attractions of the trip. The numerous places of interest about Detroit, and the hearty manner in which the local committee have entered into their work, all bespeak a pleasant time to those who attend. Owing to the proximity to Canada, it is likely that a number of the Canadian opticians will attend, especially as they are much interested in organization these days.

Points of Interest About Detroit.

Post Office. Fort Street, West, two blocks from Woodward. When at the post office take elevator and visit United States Court room on the upper two floors. This building cost \$1,000,000 and stands on the site of old Fort Shelby. See tablet at Fort Street entrance.

City Hall. Campus Martius. Largest clock in the United States. Cannon in front were captured at Perry's victory on Lake Erie, war of 1812.

Public Library. Gratiot, one block east of Woodward.



Flower Clock at Waterworks Park, Detroit.

wand. 150,000 volumes; one of the largest public libraries in the country.

County Building. Foot of Cadillac Square. In process of construction.

House of Correction. Russell Street, near Alfred. Six hundred inmates, who are chiefly employed making chairs. Open for visitors except Saturdays and Mondays.

Electric Lighting Plant. Property of city of Detroit. Alvar Street, near Bates. All public lighting is done by this plant.

Water Works. City Limits, on Jefferson Avenue. Property of city of Detroit. Cost \$7,000,000. Immense engines, beautiful grounds, earth clock, etc. Well worth a visit. Jefferson car going east.

Art Museum. Jefferson Avenue and Hastings Street. Many rare and valuable paintings and other works of art and curios. Free admission, Mondays 2 to 4 P. M. all other days, except Sunday, 9 A. M. to 4 P. M.



Grand Circle Park, Detroit.

Central High School. Cass, Forest and Warren Avenues.

Johnson Optical Co. Modern equipped factory, situated corner Washington Avenue and State Street, diagonally across from Hotel Cadillac.

Parks.

Pulmer Park. 180 acres. Woodward Avenue, six miles from City Hall. Woodward cars marked "Log Cabin" or "Pontiac." A delightful suburban retreat. One of its most attractive features is the Log Cabin with old fashioned furniture, secret room, etc.

Belle Isle Park. Two miles east from Woodward Avenue. Reached by ferries from foot of Woodward Avenue. In the center of the park is the "Zoo," with bear pit and many other interesting animals. At the head of the island a pretty view of Lake St. Clair can be had. A government lighthouse stands here. Belle Isle contains about 700 acres and cost, with bridge, \$1,800,000. The bridge is a half mile long. On the American channel is the building of the Detroit Boat Club; near the bridge and further up, the Michigan Yacht Club. In the Canadian channel ply the great lake steamers. Persons fond of bicycle riding will thoroughly enjoy Belle Isle roads and paths.

Grand Circus Parks. "Breathing spots" for down-town districts. Woodward Avenue, four blocks north of Campus Martius.

Detroit River. This river is really a long strait between Lakes St. Clair and Erie, hence, the French name, "Detroit."

City of the Straits. It is about thirty miles long and varies in width from one-half to three miles. It contains seven islands and five government lighthouses. It never overflows.

Fort Wayne. Government fort, in a commanding position on the Detroit River which curves away to the south. The "Fighting Seventh" Regiment, which took part in the famous charge of San Juan and El Caney, is situated here. Take Fort cars marked "Delray" going west.

Windsor, Canada. In the Queen's domain. **Grass Point.** On Lake St. Clair. Beautiful summer houses of wealthy citizens.

Beis Blanc Park. An island at mouth of Detroit River. A delightful ride by boat. Wharf foot of Woodward Avenue. Fare, 25 cents, round trip.

V. M. C. A. Grand River Avenue, one block west of Woodward.

Whether we consider its location, physical peculiarities or municipal management, Detroit is an ideal American city, and has always had the admiration of her civic sisters. Her people are as hospitable as the herself is beautiful, and the visiting opticians can confidently look forward to a most enjoyable time. No happier choice for the convention could have been made.

California Optical Society.

(Continued from page 825.)

Harvard boat crew that had as stroke oar and captain the generally acknowledged best oarsman of the decade, and they were awfully proud of him—was that eight-oared crew—and never tired of talking of their great stroke, but they let him do all the work. They let him pull as hard, and train as hard, and break his heart as he pleased, while they took things easy and were content in the knowledge that they had the greatest stroke in the college world and let it go at that, until one day he gathered them round him and read them a quiet little lecture and they were surprised to know that unless they woke up a little and did their share of the work they would lose their great leader, who was sick and tired of being the "whole thing." Now, don't you fellows

lose sight of the fact that you have amongst you several hard-working, bright-minded men, whom any and all of the larger Eastern associations would be proud to welcome as members, and don't "you lay on your own" and be content to allow the few do all the work. Just get up and put your own "shoulder to the wheel," as Mr. Magee so tersely put it. Drop your jealousies and back-biting and bickerings, cease acting like a lot of Dickens' poor boys; women, with their love of gossip, and be men, with the best interests of your association—which is your own best interest—at heart. With all working together the society will undoubtedly flourish in its chosen field.

A vote of thanks was extended Mr. Kuttner for presenting the association with a beautiful ballot-box made of California rose wood.



A Lake Steamer.

"PRESIDENTIAL YEAR" ADVERTISING FOR RETAIL JEWELERS AND OPTICIANS

"Presidential year" advertising is a 500 per cent. investment if right,—an expense if wrong. Thousands who never before read a newspaper, will read during the next few months. You must catch the eye at a glance and make your point quickly. Common cuts won't do it—ordinary advertising won't do it.

Will it pay you to pay me for cuts and ads that will pay you? Here's a paying proposition.

Doesn't take much of a merchant to buy goods. The selling end is the end that puzzles.



HUSTON'S CUTS AND ADS

are out of the ordinary; they catch the eye, hold the mind, reach the purse. My well placed advertising campaign for Fall and Holiday business begins September 1st.

Here is where I make a special effort to please my customers and bring them more than their share of business.

Over a thousand Jewelers and Opticians testify to the efficacy of my Holiday cuts and ads as trade bringers, and time and worry savers.

One cut, 2 ads to fit, each week, 75 cents per week. One cut and 1 ad to fit, 50 cents per week. Three months' trial—no less. No single cuts sold at any price. Remember, my cuts and ads are not seen in trade journals or elsewhere—your competitor cannot get them. If you mean business and want business **ORDER NOW.**

WM. E. HUSTON, WRITER AND DESIGNER, 150 Nassau St., New York.

The Fletcher Watch Case Protector



has been greatly improved and is more popular than ever. Made in 16 and 18 sizes; also a new size, the 12 size, is just out. **\$1.50** per dozen.

YOUR JOBBER HAS THEM.

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Photographs on Watch Dials and Caps.



Price, 75 Cents. Single or group pictures. Sample Dial, 25 Cents.

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New Polishing and Grinding Machine

This machine is designed especially to meet the demands of the jeweler. It will carry emery and buffing wheels up to 6 inches in diameter, and with perfect ease speeds to 2500 revolutions a minute.

Economy of space reduced to the minimum.

We also make a line of Foot-Power Lathes for heavy jewelry work.

SEND FOR CATALOGUE.

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W. H. BROKAW, The Auctioneer for Jewelers.

An experience of twelve years with the jewelry trade as an auctioneer enables me to obtain for you the best possible results. By my methods in conducting auction sales, I can realize for you on your stock an average of at least **ONE HUNDRED CENTS ON THE DOLLAR**, and at the same time conduct the sale in such a way that your future business cannot be injured in the least; on the contrary, it will be increased. My methods are strictly up to date, and entirely in keeping with high-class trade. I never fail to give entire satisfaction to both dealer and customer, and I give my personal and entire attention to the business. Many of the largest and most successful sales in the jewelry trade have been conducted by me. Should you desire to raise money, or get out of business, or reduce your stock, or change your location, or should there be any reason whatsoever for your wishing to convert your stock into cash, without any loss whatsoever, I can accomplish it quickly and to your entire satisfaction.

W. H. BROKAW, 52 Maiden Lane, New York City.

Optical Notes.

• The Globe Optical Co., of Omaha, Neb., has completed the new front to its store and it now boasts of as neat a place as exists in that city.

• "C. W.," of Boston, is hereby informed that we do not solve cases in our "Question and Answer Department," except they come from subscribers.

• Frank Colby, manager of the Globe Optical Co., Omaha, Neb., was in Kansas City, Mo., several days during National Democratic Convention week.

• Chas. F. Francis, the New York optician, will spend the greater part of August residing at Lake Champlain, in the upper part of New York State.

• J. M. Morrow, in charge of the kodak department for D. C. Prudden, Kansas City, Mo., was on the sick list last month, but is again able to be at his post.

• Mawhinney & Holliday, Omaha, Neb., local retail jewelers, have completed all arrangements for an optical goods department and have it now opened up for business.

• A. J. Bailey, formerly of A. J. Bailey & Bro., Ontario, Cal., has purchased the optical business of P. S. Hunt, of Sacramento, Cal., and will personally take charge of same.

• H. B. Vining, Kansas City, Mo., is contemplating making a number of changes in the arrangement of his optical parlor that will greatly add to its comfort and attractiveness.

• Dr. C. W. Ayres, manager Kansas City Optical Co., Kansas City, Mo., received a shock during one of our recent electrical storms that disabled him for a short time, but is again at his post of duty.

• Dr. Werts, manager of the optical department of the Aloe-Pendol Co., Omaha, Neb., is happy in the return home of his wife. Mrs. Werts has been visiting friends and relatives in Cincinnati, Ohio, for some time.

• The C. L. Merry Optical Co., Kansas City, Mo., have recently added several new grindstones to their manufacturing department, and are contemplating the change of the firm-style of name to "The Merry Optical Co."

• Eugene Suddam, formerly with J. B. Lichtenberg, optician, of Kansas City, Mo., is now in the employ of the C. L. Merry Optical Co., of that city. Frank Dalton, of this latter firm, is back at his bench after a brief vacation.

• Elwood Riggs, manager Columbian Optical Co., Kansas City, Mo., was away on a business trip of several days last month. This firm is sending out from their various offices their new catalogue, which has just been issued, and which is very complete and attractive.

• R. A. Davis, Springfield, Tenn., has completed a little brochure containing fifty-two well-written optical advertisements, which busy opticians will find convenient and profitable to use. They are supplied in physiology, well-set and without illustrations.

• Mrs. J. W. Talbot, Nevada, Mo., has just returned from Kansas City, where she spent a month in the Southwestern Optical College. She is thoroughly trained in the art of fitting glasses, and has taken charge of the optical department of the J. W. Talbot jewelry store.

• T. W. Swiley, expert watchmaker and optician, late with A. Weiner, New York City, is now associated with J. P. Sprague, Newport News, Va. Mr. Swiley has fitted up a handsome optical parlor in the rear of the store and is meeting with great success in his optical work.

• T. C. Hutson & Co., a firm which has recently entered the wholesaling and manufacturing of optical goods, having formerly conducted a retail establishment, are getting out a handsome catalogue. It is stated, but not yet confirmed, that the company is contemplating the establishment of a branch factory in another State.

• A. I. Agnew, manager for the Columbus Optical Co., Omaha, Neb., spent the week of National Democratic Convention in Kansas City, Mo., as the guest of Elwood Riggs, manager of the Kansas City office of this company. Mr. Agnew was accompanied by his brother, who is a bright and promising young man.

• At the Louisiana State Fair, held in New Orleans in May and June, the Bourque Optical Co., of that city, won a gold medal and diploma for their display of optical instruments and merchandise. This firm started in the jobbing business in May and have a large and comprehensive stock to meet the requirements of the trade.

• Joe Friedberger, Lodi, Cal., has made arrangements to have a first-class optician at his store every Wednesday afternoon.

• H. J. Penfold, of the Aloe-Pendol Co., Omaha, Neb., wholesalers and retailers of optical and surgical goods, is up to his neck in work, getting ready for the fall festival. Mr. Penfold is a member of the board of governors of the Knights of Ak-Sar-Ben, which prepares and produces the floats and other features of the fall pageants that take place in Omaha.

• F. A. Hardy & Co., Chicago, have issued their 1900 catalogue, a handsome, illustrated compilation of nearly 200 pages. It is such a work of reference as no optician can afford to be without. An excellent feature of the catalogue is a marginal index, which enables the optician to open the book at the place desired. It covers the entire optical field and contains much valuable descriptive information.

• Chambers, Inskeep & Co., Chicago, have issued a new optical catalogue, a handsome cloth-bound volume of some 150 pages, a copy of which will make a valuable addition to the reference library of every optician. It is compiled on the conventional lines, with copious illustrations and descriptive matter. Handsome half-tone cuts of the various departments of the firm form a fitting introduction to the volume.

• Worcester R. Warner, of the firm of Warner & Swazey, well-known manufacturers of astronomical instruments and field glasses, of Cleveland, Ohio, sailed for Europe July 26th for a two-months' visit on the continent. Mr. Warner was accompanied by his wife and sister and will spend the greater part of the visit in Switzerland, after stopping at Paris to take in the Exposition. The trip is of some importance.

• The students and graduates of the Klein School of Optics, Boston, Mass., will be sorry to learn of the death of Mrs. Agnes C. Klein, wife of Dr. A. A. Klein. Although Mrs. Klein took no active part in the Klein School, yet her pleasant and cheerful face will be missed by all. Most of the students and graduates will remember the motherly interest she took in the welfare of the students. All will sympathize with the doctor in his great loss. Mrs. Klein died after an illness of ten days at her summer residence at Monponsett, in her fifty-first year. Dr. Klein and his wife had been married over thirty-two years. Four children were born to them. All of them take an active part as instructors in the Klein School of Optics.

• The following item from a Milton, Pa., journal describes a species of fraud which opticians would do well to look out for. The item says: "On Saturday last five victims called at Jeweler Fiedler's to have their glasses exchanged. One old lady had paid the stamps eight dollars for a pair of worthless glasses, not worth seventy-five cents. These sales were made on the representation that they were traveling salesmen for Mr. Fiedler. On the same day several more who had purchased glasses came in to see about them. They said the fellows did quite a big business, but as most of those who had been swindled had only paid a couple of dollars on account, they preferred to keep quiet rather than admit that they were swindled. Mr. Fiedler offered a reward of \$25 for the arrest of the parties."

• The Eastern trade were shocked last month by the sudden death of Samuel Wilson Slocum, the New York representative of the Day State Optical Co. Mr. Slocum was a young man admired and respected by all who knew him for his unassuming and obliging ways and the fidelity with which he served both his patrons and the company he represented. He was at his office as usual on July 2d, but complaining of being unwell. The next day he was worse and remained home, and on the following day his condition became so serious that he was removed to the Montclair (N. J.) Hospital. He was operated on in the morning of the Fourth for appendicitis, and the doctors took a favorable view of the case, but the intense heat of the day had a disastrous effect and peritonitis later set in and caused his death in the evening. He leaves a widow and two bright boys, aged one and three years. The deceased was born in Minnesota, in 1869. His father died when he was quite young and his mother moved with the family to Springfield, Mass., where young Slocum received his education. He became connected with the jewelry business and worked for several of the manufacturers at Providence, among them Hamilton &

Hamilton, Jr., and George H. Fuller & Co., of Pawtucket. He entered the employ of the Day State Optical Co. in the spring of '95, and since then has represented the company in New York City and the East. He was married in 1896 to Miss Margaret E. Tidmarsh, daughter of Captain James J. Tidmarsh, of the U. S. Transport Service. There is deep sympathy among the trade for Mrs. Slocum, whose bereavement has touched a sympathetic chord in the hearts of the many friends of her devoted husband.

New York City Optical Society.

The committee in charge of arrangements for the mid-summer social gathering of the society, held a meeting and decided that a dinner should be given at Brighton during the latter part of August, the exact date to be decided later. A private dining room was engaged, and covers will be laid for fifty. The dinner will cost \$1.50 a plate.

Wisconsin Optical Society.

The Wisconsin Optical Society met at the Plankinton House, Milwaukee, July 20th. President Snider was in the chair, and over half the members were present. This young society has forty-five members, and expect to increase this to seventy-five in the near future. Provision was made at the meeting to incorporate under the State law, for the better protection of the membership, should occasion arise.

The scientific part of the session included addresses by Chas. McCormick, of Chicago, on "Theory and Practice;" by I. M. Addelman, of Tomah, on the subject "Is It Necessary to Use Cycloplegics in Optometry," and by Gustave Kahn, of Wisconsin, on "What Our Association Can Accomplish for the Good of Members and the Profession." Mr. Kahn made a stirring plea for the hearty co-operation of all opticians in the State organization, and pointed out the many advantages to be gained by working together. Following his address Mr. Kahn also suggested the granting of certificates to members that would show their connection and standing with the society. This met with favor, and a committee was appointed to carry out the plan. This is in line with the drift in sentiment in other sections of the country, and will tend to elevate the standing of legitimate opticians and the society alike.

It was decided to hold the next meeting January 6th, at Oshkosh.

To Be Seen at Detroit!

Those who are fortunate enough to attend the annual meeting of THE AMERICAN ASSOCIATION OF OPTICIANS, to be held in the city of Detroit this month, should not fail to see the exhibit of the A. Jay Cross Optical Co., of New York, and examine the two new optical instruments: THE CROSS RETINO-SKIAMETER and THE CROSS DIOPTROMETER, which have been recently placed on the market by this well-known house.



A NEW SCIENTIFIC INSTRUMENT FOR EXAMINING EYES BY THE SHADOW TEST

THE CROSS RETINO-SKIAMETER, particularly, is an instrument which is calling forth the most extravagant praise from all who are using it, for not alone can ocular pupils be enlarged without the use of drugs, but the changing of the refractive value of the instrument is done so easily that many who had, practically, abandoned the "shadow test," by the old system, have taken it up again and find the new method to be far in advance of all others. Then, too, those who have never practiced skiascopy, in their examination of eyes, cannot fully appreciate the manifold advantages to be gained, both in reputation and in work, until they have fitted themselves with instruments and by time, study and perseverance have striven to truly merit the confidence of the public.

See back numbers of THE KEYSTONE for more extended description of the Cross instruments. —Adv.

ASK YOUR JOBBER FOR

THE WORKINGMAN'S SPECTACLES.

PATENTED

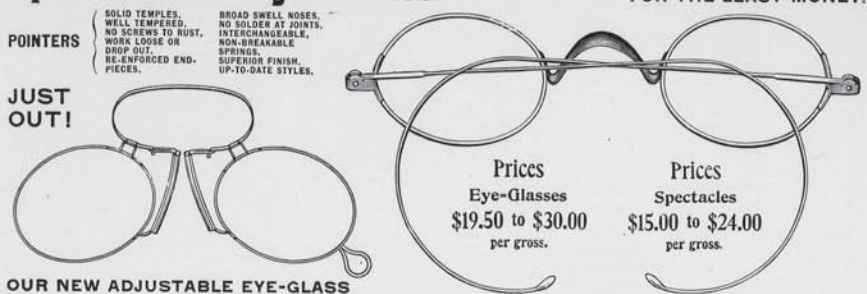
TO BE HAD FROM JOBBERS ONLY

EXPANSIBLE

Spectacles and Eye-Glasses. THE BEST WEARING QUALITIES FOR THE LEAST MONEY.

POINTERS
SOLID TEMPLES.
WELL TEMPERED.
NO SCREWS TO RUST.
WORK LOOSE OR
DROP OUT.
RE-ENFORCED END-PIECES.
BROAD SWELL NOSES.
NO SOLDER AT JOINTS.
INTERCHANGEABLE.
NON-BREAKABLE
SPRINGS.
SUPERIOR FINISH.
UP-TO-DATE STYLES.

JUST
OUT!



Prices
Eye-Glasses
\$19.50 to \$30.00
per gross.

Prices
Spectacles
\$15.00 to \$24.00
per gross.

MADE IN THREE QUALITIES OF MATERIAL.

No. 1690. NICKEL SILVER.—A white metal resembling silver, high lustre that will not tarnish or rust, more durable than steel.
No. 1590. GOLD FILLED.—Made from seamless in K. stock, and electro plated, wear and LOOK LIKE GOLD. Each Pair Tagged and Guaranteed to Wear to Year.
No. 1740. COLOIDIN.—A combination of metals resembling K. gold, highly finished and chemically treated to withstand atmospheric changes.

Among the jobbers
handling these
goods are the
following:
JULIEN KING OPTICAL CO., New York City.
S. F. MYERS CO., New York City.
ELIASHOF BROS. & CO., New York City.
OTTO YOUNG & CO., Chicago.
F. A. HARDY & CO., Chicago.
GENEVA OPTICAL CO., Chicago.
COLETTI OPTICAL CO., Chicago.

J. M. A. C. JOHNSON, Chicago.
HUGHES OPTICAL CO., St. Louis, Mo.
L. BAUMAN JEWELRY CO., St. Louis, Mo.
OHLAMP NOTING & CO., Cincinnati, Ohio.
E. & J. SWIGART, Cincinnati, Ohio.
A. & J. PLATT, Cincinnati, Ohio.
C. L. MERRY OPTICAL CO., Kansas City, Mo.

L. BLACK & CO., Detroit, Mich.
JOHNSTON OPTICAL CO., Detroit, Mich.
GLOBE OPTICAL CO., Boston, Mass.
H. L. ROUGHTON, Boston, Mass.
E. W. REYNOLDS, Los Angeles, Cal.
R. LAWRENCE, Toronto, Ont.
LYON BROS., Chicago.

LENSES TO SUIT YOUR TRADE

PERISCOPE DOUBLE OR PLANO.
COQUILLE OR MICOQUILLE.

Why continue to sell common plated knives when

SMITH'S PATENT "STEEL EDGE" TABLE KNIFE

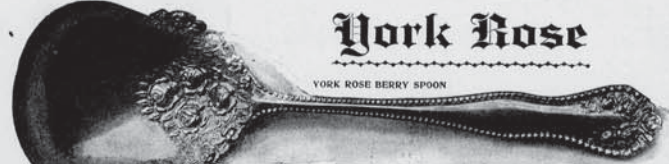
is only about the cost of
triple-plated table spoons



This Knife has attracted more attention than any other product in silver-plated ware since that industry was born.

Because IT STAYS SHARP.
WILL NOT PIT OR STRIP.
CANNOT RUST OR BLACKEN.

Made entirely of German silver, except for a steel strip five thousandths of an inch in thickness inserted within the blade. Thus it never requires resharpening, and when plated on a German silver base the plating STICKS.



York Rose

YORK ROSE BERRY SPOON

\$1.00

for this handsome
BERRY SPOON

TRADE MARK

High-Grade Quality Only

A SELLER! Wide-awake dealers have found this pattern a very profitable investment.

DO YOU HANDLE THE GOODS? Send \$1.00 and have mailed a Berry Spoon in this pattern, in satin-lined box.

WRITE FOR FOLDER "L." It tells some truths about standard selling prices for Silver-Plated Flatware.

Jewelers visiting Chicago during the National Encampment of the Grand Army of the Republic, which convenes there August 25 to September 1, 1900, will find a full line of these goods on display at the store of LAPP & FLEISHER, State and Adams Streets, who are our Chicago distributing agents.

Full Line of Plated Flatware

E. H. H. SMITH, Manufacturer,
38 Murray Street, New York

AUGUST, 1900

THE KEYSTONE

841

Items of Interest.

The eleventh year and the new term of the Canadian Horological Institute, Toronto, began on September 3rd.

Ernest G. Ransome, formerly with Harry F. Howe, Littleton, N. H., has opened a store in New Wharfedale, Wash.

Norton-Pulson Jewelry Co., incorporated, has succeeded J. A. Norton & Co., wholesale jewellers, Kansas City, Mo.

Elmer Elsworth Bassett, Wahpeton, N. Dak., was married July 11th to Miss Annie Teresa Morder, of that city. THE KEYSTONE extends congratulations.

E. L. Spencer and wife, of Richmond, Ind., recently returned from a two-weeks' trip to Chicago, Ill., Benton Harbor and other Michigan points. He had a delightful trip.

The chattel mortgage given by J. L. Field, Pittsfield, Ill., for \$1115 in favor of Lovell & Crane, whom he succeeded, has been released, Mr. Field having paid the amount in full.

Jeweler Clarence H. Shafer, of Cobleskill, N. Y., has complete volumes of THE KEYSTONE of the following years, that he will sell cheap: 1890, '91, '92, '93, '94, '95, '96, '97, '98, '99; seven numbers of 1900 and four of 1899.

At the bowling carnival held at Scherz Park, Union Hill, N. Y., last month, the bowling team of the New Columbus Watch Co., Columbus, Ohio, won third prize. The occasion was the international tournament of the United Bowling Clubs, and the victory of the Columbus players was one to be proud of.

Among the recent arrivals at the St. Louis Watch-making School, St. Louis, Mo., was R. Kadarsky, of Blackall, Queensland, Australia. The trip from his native land consumed thirty-four days. The school was closed for repairs on July 26th and 27th. A recent welcome visitor at this school was F. W. Schuler, principal of the Philadelphia College of Horology.

The M. L. Landis School of Engraving, at Detroit, Mich., has been making quite extensive improvements for the past month. The office and school rooms have been enlarged and now occupy half the front of the Clawson Building. The rooms are light and airy and have been newly decorated throughout. This will give them plenty of room to meet all requirements of their business in the future.

Since the resignation of J. R. Parsons, who was compelled by ill health to seek a milder climate, the horological department of Bradley Institute, at Peoria, Illinois, has been without a principal. The Board of Trustees has just appointed A. T. Westlake to the vacancy, with the title of Dean of the Horological Department. Mr. Westlake has been in the trade for a quarter of a century, and has had charge of large jewelry stores in Iowa and Illinois. He has held responsible positions with the Elgin National Watch Co. and with the Illinois Watch Co. He has, also, had much experience as a teacher of watch work, engraving and optics. The horological department is doing some very fine work in drawing in connection with the advanced watchwork. One hour a day is given to this work under the instruction of Grant Hood.

One of the most popular citizens of Portsmouth, Ohio, passed away June 25th, in the person of Edward Lee Feyler, the well-known jeweler of that city.

Cancer of the stomach was the fatal malady. Mr. Feyler was born and raised in Budapest, Austria-Hungary, and there too he learned the jewelry trade. He came to this country in 1884, spending some time in Indianapolis. In 1889 he located in Portsmouth, and after being there for a short time established a store of his own at No. 71 West Second Street. Only last fall he removed to a new building on Second between Washington and Chillicothe Streets, with every prospect of a long period of business success. His death is greatly regretted by a wide circle of friends.



Edward Lee Feyler.

J. H. Freese, of Napoleon, Ohio, is putting in a new tile floor and otherwise rearranging and beautifying his store room. This will make a marked improvement when completed and give him plenty of room for the large fall trade that is coming.

M. S. Benedict Mfg. Co., East Syracuse, New York, has issued a beautifully compiled and richly illustrated catalogue showing a full line of their product in flatware, hollowware, sterling silver goods, white metal novelties; also, a new line of toilet sets and Ormolu gold-plated clocks. The illustrations are prettily executed, and show to advantage the high-grade, coated paper. There are a number of pages lithographed in colors, which show effectively the tinted ornamentation on the goods.

J. R. Parsons, famous as a teacher of horology, who founded and was principal of Parsons' Horological Institute, Peoria, Ill., and subsequently head of the horological department of the Bradley Polytechnic Institute of the same city, has opened a school for the teaching of watch-making, engraving, jewelry repairing and optics in Los Angeles, Cal. Mr. Parsons was compelled to go to Italy California by the failing health of his wife, and the many former students of Mr. Parsons will be pleased to learn that her health is improving. The new school is ideally situated and thoroughly equipped, and will be conducted with Mr. Parsons' customary success.

The Boston Budget, of recent date, reproduces an excellent likeness of George C. Hughes, who holds an important position with the Horton-Angell Company, the well-known jewelry manufacturers of Attleboro, Mass., accompanied with a short sketch of his life and his work as a poet and author. The Budget thus speaks of Mr. Hughes as a worker in the world of letters: "The verse work of his writer is not unfamiliar to Bostonians, as his contributions to the Transcript and Budget, besides other papers, have been frequent. Mr. Hughes has been urged by his friends and critics to publish his poems in book form, and if this move is decided upon, the collection will form a delightful group." Some of his best work comprises "The Wreck of the Bakenhead" and "Under Torture," and of the others many readers have found pleasure in "Daybreak at Sea," "The Under Drib," "After Thirty Years," "A Dream Journey" and "When Humanity Unmasks."

"Might as well try to get along without one's dinner as to try to do without THE KEYSTONE."—W. A. Dixon, jeweler, Unionville, Ontario.

Death of James J. Horton.

Following so closely the sudden death of Mr. Slocum, their Eastern representative, the many friends of the Bay State Optical Co., have been shocked at the announcement of the sudden death of James J. Horton, one of the three original partners of the concern. His death occurred Sunday morning, July 22d. Mr. Horton had spent several days of the previous week at the summer cottage of his brother-in-law, Captain Herbert A. Clark, at Shawmut Beach. Here THE KEYSTONE representative called on him and spent a pleasant evening. Mr. Horton did not then complain of feeling unusually ill, although it was apparent that he was being affected by the intense heat then prevailing. He had been much grieved at Mr. Slocum's death, and was anxious to get back to the office again, but was urged to remain another day and get the benefit of the cooling breezes that come from the bay, which he finally consented to do. Deceased was one of nature's noblemen, and combined to a singular degree the aggressive qualities of the successful business man with the consideration for others which left him an abiding place in the hearts of those who knew him.

James Jackson Horton was the descendant of a family which came to America less than two decades after the Pilgrims landed on Plymouth Rock. From these sturdy ancestors he inherited the brave spirit which enabled him to fight years of disease as his forefathers fought the foe through the long days of the Revolution. The Horton family through five generations lived in this immediate vicinity, and in the direct line was the late Gideon M. Horton, whose four sons were Everett S. Horton, Edward J. Horton, Gideon M. Horton and James J. Horton, four of the most valuable citizens Attleboro ever had.

James, the youngest brother of the four, was born in Providence during a brief period that his parents were living there, but as all his remaining life was identified with the town he is regarded as a true Attleborian. His birthday was October 19, 1841, and it was in 1842 that his family returned to Attleboro. His youthful days were spent in the

common schools and the Attleboro historian notes that among his instructors were Mr. Bailey and Mr. Allen, two of the most conspicuous of the early school masters of the community. Following his school days he lived on his father's farm, the home dwelling being on Pleasant Street on the very site of the fine residence in which his later years have passed. It was in 1855 that he was stricken with an illness from which he never recovered. Until his death he was obliged to be ever mindful of his feeble condition and to undergo periods of suffering of the most excruciating variety. The fine spirit in which these were endured and the ready recovery of his naturally buoyant and even humorous disposition testified to the true worth of the man.

He engaged in a mercantile business in Providence for a very short time in the late '60s, but in 1870 was again in Attleboro, where he had retained his home. He was from then until 1876 in the insurance business, which he gave up to become a jewelry manufacturer. He was one of the three original partners in the firm of Short, Nersey & Co., with him being Mace R. Short and Peter Nersey. Until 1897 the business was very successfully conducted, but in that year the firm began to make optical goods. For several years this new branch of the business grew to such an extent that three years later the firm name was changed to the Bay State Optical Co. and the other lines of goods gradually discontinued. Their former experience in making gold filled goods gave them a big advantage in producing the finest gold filled optical goods. The great fire in the jewelry business section of Attleboro, on May 19,



James J. Horton.

1898, swept away the shop, but a very few days later found the firm doing business in a factory they had purchased on Pleasant Street. The firm continues there, and its future success will be in no small degree due to the start given it under Mr. Horton's active management. Aggressive and enterprising as a business man Mr. Horton was remarkably retiring in all other walks of life.

Mr. Horton was a member of Orient Lodge of Odd Fellows and of Attleboro Council of the Royal Arcanum. He was also a director of the First National Bank of Attleboro. In whatever connection he appeared he was always courteous and kind, and bore himself a true gentleman. The undying youth in his heart displayed itself in a friendly interest in and generosity toward younger men, and improvement in the circumstances of more than one may be traced to his kindness. That he was so loved as he was kind was illustrated by an incident during the civil war, when he, though an invalid, made his way to the firing line in one of the hot battles of the Wilderness, to visit his brother, Major E. S. Horton, and was as cool under a withering fire as the most hardened veteran. Some years later he had a miraculous escape from drowning. A small steamer he was on sank, in the middle of the night, with a great loss of life, including his own brother, who shared the same state-room with him. Both left the room at the same time, never to see the other, in this life.

Mr. Horton leaves a widow, formerly Miss Emily Howard Clark, of Middleboro, but no children. The only other near relatives are his brother, Major E. S. Horton, his niece, Mrs. Mary Smith, Miss Gertrude Horton and Mrs. Edith M. Gardner, a nephew, Raymond M. Horton, and Mrs. Horton's mother, Mrs. Samuel W. Clark, and brother, Captain Herbert A. Clark. The funeral took place at his home, July 25th, and was largely attended by not only townspeople and members of the fraternal societies he belonged to, but by a number from Providence and other places.



WOULD you like to make more money? then write me. I can tell you how and help you do it. If you have made all you care to, send me your photo. I make money for jewelers by planning and conducting successful auctions for them. That's my business. Got it down to a science; an old campaigner, a past master of the art, cut out expressly for the work, and know every crook and turn in the road. Taking me up one side and down the other, you'll find I'll compare favorably with those who crow much and scrape little. If you intend holding a sale this Fall or Winter, you should make your arrangements now. Let me submit my plan. It will pay you well. No place too far for me to go. I follow the flag.

"I shake the tree,
You gather the fruit."

JOHN H. RAVEN,
Holland, Michigan.

The Only Jewelers' Realizer in the United States

reached by honest and hard labor, and many jewelers of twenty-three years, I told you as much as an application, as I have made for them auctions far beyond their expectations. Also, refer to Union National Bank, Kansas City, as my wholesale jewelry house in Kansas City. If you are thinking of an auction, write me. I will do your work right and cheap.

Brownwood, Tex.,
June 12, 1900.
Mr. D. O. Herndon,
Kansas City, Mo.

Dear Sir—After nearly ten months of prosperous business since the sale you made for us, we certainly are more than pleased with the results. Both points, viz.: Cash realized at the sale and effort afterwards on our business. Your methods and treatment of customers as well as the results with us, was of the best. You may give us no reference to any intending to hold a sale. Wishing you continued success, we remain, Yours truly,
DeClark & Son.

Springfield, Mo., March 17, 1900.
Mr. Herndon has just closed a very successful sale for us. We found him possessed of the requirements that make a first-class auctioneer. A good judge of human nature, and works as much for your interest as his own. We think his method of selling the best we ever saw, and have no hesitancy in recommending him as the leader of auctioneers.
THE TOWER JEWELRY CO.

ALL INQUIRIES STRICTLY CONFIDENTIAL.

D. O. Herndon, JEWELERS' REALIZER,
Office—333 New York Life Building,
KANSAS CITY, MO.
Telephone 1241.



Notice.—Investigate, then ask yourself if a **BETTER SELECTION COULD BE MADE.**



A. Gottlieb.

The trade obtains the services of two experienced men **AT THE COST OF ONE.**

We challenge any auctioneer in the world to equal us in ability to make large profits and to hold and entertain large audiences successfully.



W. A. Stanley.

SENT FREE, a book giving some valuable information to the trade, also many references and press notices.

Established 1882.

GOTTLIEB & CO. 203 S. Clark St., CHICAGO, ILL.

Mighty Men O' The Hammer



Send for booklet containing several hundred references and testimonials from all over the country and information in regard to auction sales.

THE TRADE

will not fail to perceive the great benefit of obtaining the services of two experienced men at the cost of one. The audience never gets tired; each has his own methods, and there is a change of voice and manner; also in case of sickness, it is an invincible argument. We work in perfect harmony, and it makes a degree of success in sales never before known. We are proving it is the greatest combination of talent ever available.

We are now taking a much-needed rest, after what we are modestly inclined to believe the best year's business in our line ever made in this country. Our purpose is always to be honest in our business transactions with the jewelers, both in conducting sales and in our advertising. Will be pleased to negotiate with those contemplating sales during the coming season.

BRIGGS & DODD, 334 Dearborn Street,
Room 1230, Chicago, Ill.

Jewelers, Please Notice!

Owing to the rush of business I have been forced to **change my headquarters**, and from this on my address will be **92 State St., Room 702, Chicago, Ill.**

You can judge a man's capabilities by the results from his work. **It is good results we all want. Here is a sample of good results:**

F. H. POPE
Dear Sir—Answering yours of the 18th, will say that every day's sale you held for me averaged from 5 per cent to 11 per cent above cost on all goods sold after all commission had been paid. I am more than satisfied with the sale. Yours truly,
M. J. GRASSY.
WINONA, MINN.
Dear Sir—I shall be pleased to testify to your abilities as an auctioneer and as a gentleman to anyone interested. You made a very satisfactory sale for me under the most trying circumstances. Respectfully,
W. DORFMEYER.
Winona and Lacrosse, Wis.

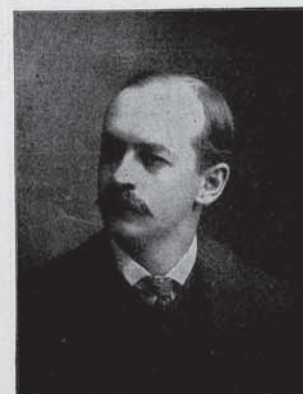
RECENT SALES

I. J. HOFFMAN, St. James, Minn.
SMITH & PANDY, Hastings, Minn.
J. L. SWIFT, Lacrosse, Wis.
E. STODOL, Crispin, Minn.
DEWITT & KNOX, Scotland, S. Dak.
R. H. MOORE & SONS, Milwaukee, W. C.
D. KANTHMER, Horton, Wis.
W. F. SEWERY, Jewellville, Wis.
R. R. HENDONMAN, Charlottesville, Va.
H. A. EVANS, Grand Forks, N. Dak.
WILL COLLINS, St. Carroll, Ill.
CULVERSON & HARRIS, Greenfield, Ia.
J. F. FENLEY, Monticello, Iowa.
W. C. NELSON, Washington, Iowa.
W. R. CLAYTON, Monticello, Iowa.
R. COX & SONS, Allegheny City, Pa.
M. BEEBEY & CO., Chicago.
C. C. CLARK, Oakland City, Ind.
J. M. GRASSY, Lacrosse, Wis.
W. DORFMEYER, Lacrosse and Winona.

Now is the time to make dates for next fall. You will find it a mistake to wait too long. Drop a postal card and get booklets on auctioneers and methods, free. Address

I have just returned from California, where I held sale for **B. S. Stephenson, Redlands.** Write him for the results.

PERCY E. POPE, Jewelry and Art Goods Auctioneer, 92 State St., Chicago, Ill.
(ROOM 702)



The Recognized Auctioneer for Jewelers



P. J. BURROUGHS
103 STATE ST. CHICAGO, ILL.

\$100.00 IN GOLD

Awarded to MR. G. GOODMAN, Hallock, Minnesota.

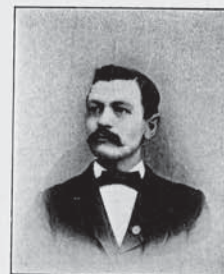


IN our prize competition, just closed, we received a large number of beautifully engraved samples from all parts of the country. After a critical examination, Mr. Goodman's was found to have the highest number of meritorious points, and accordingly we shipped him by American Express, **ONE HUNDRED (\$100.00) DOLLARS IN GOLD.**

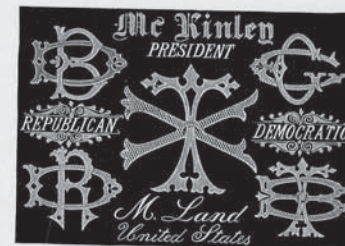
While we promised nothing beyond this prize, we received many other finely engraved samples, and from among them selected specimens by FRED. A. WILLIAMS, Augusta, Wis., and JOHN A. HEUSER, Bedford City, Va. These gentlemen were each awarded special prizes.

**We Shall Make Another Liberal Prize Offer
in the September KEYSTONE.**

"It pays to buy an Eatoh-Engle."



G. GOODMAN



PRIZE PLATE

When you write for our catalogue, we send you an aluminum Hat Mark engraved with your initials, because we believe that, as a business man, you want to know what kind of work an Engraving Machine can do before you place an order. These samples are so beautifully done that some have honestly believed they could not be done by a machine, while others, from self interest, have asserted openly and by inuendo, that they were cut by hand.

To all jewelers who feel an interest in honest and upright business methods, we would say that we will engrave at any time for visitors at our office, a duplicate Hat Mark such as we send out for samples. If we cannot do it, we will cheerfully hand over One Thousand (\$1,000.00) Dollars in cash. No other manufacturer dare engrave samples or make such an offer.

MONEY TALKS

Write us to-day and let us tell you all about the only Real Engraving Machine, the "Eatoh-Engle."

The Eaton & Glover Company

87 Nassau Street, NEW YORK

The Recognized Auctioneer for Jewelers



P. J. BURROUGHS
103 STATE ST. CHICAGO, ILL.

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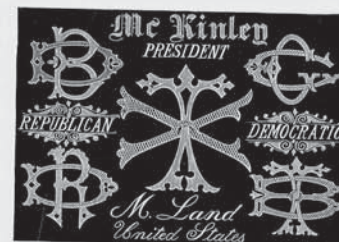
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