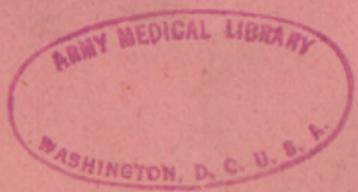
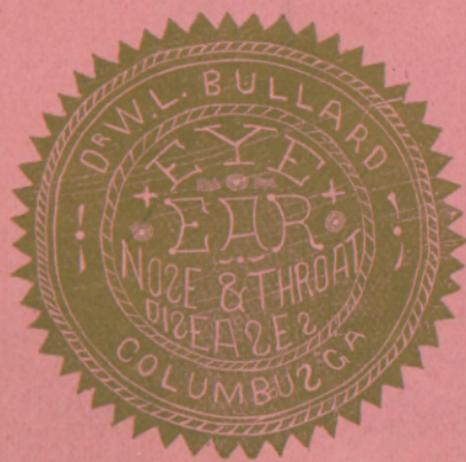


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OPTICAL HYGIENE,  
WITH COMPLIMENTS  
— OF —





He that is stricken blind cannot forget  
The precious treasure of his eye-sight lost.

—*Romeo and Juliet.*

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OPTICAL HYGIENE,

—OR—

The Refractive Care of our Eyes.

---

COMPLIMENTS OF

DR. W. L. BULLARD

PHYSICIAN AND SURGEON,

For all Diseases and Deformities of the

EYE, EAR, NOSE <sup>AND</sup> THROAT,

COLUMBUS, GA.

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ATLANTA, GA.

THE BUREAU OF OPTICAL HYGIENE, 120 N. W. CORNER OF

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# OPTICAL HYGIENE.

“One with both orbs quenched in eternal night  
Enviest his purblind friend's faint ray of light.”—JUVENAL.

There is no part of the human body to which the old adage of “an ounce of prevention is better than a pound of cure” applies more forcibly than the Eye—no other sense that we would not more quickly part with than the sight, and none that yields a greater solace and delight than unimpaired vision. In the whole gamut of sensibilities, nothing touches the heart with greater pity than the blind, and this peculiar misfortune challenges our most active sympathy. To anticipate the danger becomes a duty, yet how few have any knowledge of the use and functions of the Eye, as to color blindness, the size and form that objects should appear naturally, defects that prove serious drawbacks to a child's proper intellectual, commercial and mechanical advancement. To aid in a better understanding of the workings, and the threatened dangers of this beautiful and wonderful member, the following pages have been written.

In prescribing for the proper care of our eyes *refractively*, is to advise the deprivation of such diseases or weaknesses of the eyes as are avoidable, by the proper adjustment of glasses. But we must know something about the eye and its weaknesses to efficiently follow the prescription—that is, we must know what certain feelings about the eyes mean, such as pain, fatigue, dread of light, and why the eye is so often subject to fatigue, pain, &c. Because our eyes ache, and become painful when we

look on reflected light, we cannot afford to give up the entire use of them, neither can we wholly disregard ominous symptoms without the risk of impairing sight or losing it. Asthenopia is the technical name for weak sight, [Gr. *asthenes*, weak, and *opsis*, vision] or a name for a group of symptoms caused by errors in the refractive media (cornea lens vitrous.) The first symptoms of asthenopia, or weak sight, is a tired feeling of the eyes during or after reading, writing, sewing, drawing, &c. If this symptom is disregarded, we soon find that the letters appear to run together, and if we continue to use our eyes, reading becomes impossible. If we rub the eyes, or look in the distance, quick relief comes and we see as clear as ever, but a return of pain and confusion of sight is reproduced as we again attempt to read or use the eyes for near work.

Let us consider for a moment the structures of the eyes and how we see; in so doing we may be better able to comprehend the nature of "Weak Eyes." The Fig. 1 (one) gives an anatomical idea, sufficiently full for our purpose.

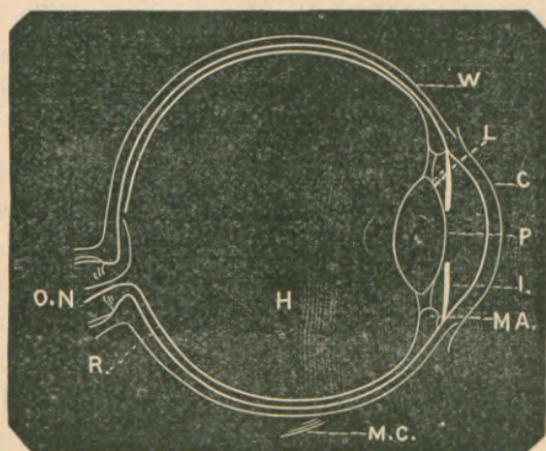


Fig. 1.

Figure 1 gives a profile view of the eye; that is, the eye-ball is divided into two equal parts, just as one might divide an apple or an orange, and the flat, cut surface held up to view.

W points out the white of the eye, a strong protective coat extending quite around the eye-ball except in front. It is called the *sclerotic coat*.

C, the *cornea*, or transparent front of the eye; and, behind it,

I, the *iris*, or colored part of the eye, extending in a circle around

P, the *pupil*, which is a circular hole in the iris, that admits the light into the eye, and out of which the eye sees.

L is the crystalline *lens* directly behind the pupil. In health the lens is transparent like the front of the eye, and offers no obstruction to the passage of rays of light; but if it becomes opaque, it is called *cataract*, and the eye is more or less blind from the obstruction of the passage of light.

M A is a little muscle, called the *muscle of accommodation*, that adjusts the focus of the lens and the eye for near objects.

M C is a muscle attached to the white of the eye on the outside, that converges or turns the eyes inward, and is the *muscle convergence*.

R points to the inner lining of the eye, the *retina*, upon which images of objects are pictured; and

O N is the *optic nerve* that conveys these pictures to the brain.

H is the body of the interior of the eye, filled by a transparent *humor*.

When we look at an object, the rays of light enter our eyes through the pupil (P, in Fig. 1,) and passing back to the retina (R. in Fig. 1), which is the inner coat of the eye, forms an image of the object upon it similar to that formed on the plate of the camera of the photographer.

The optic nerve (O, N, in Fig. 1) completes the transmission of the impression to the brain, after its reception upon the retina. If the rays of light are brought to a point exactly as they reach the retina (A, in Fig. 2) vision will be clear and distinct; if they are focused in front or behind the retina, the sight will be more or less blurred. This focusing power is called *accommodation*—that is of adjusting itself for vision at different distances, so that the rays of light are focused upon the retina alike when we look at a far off mountain or read a book. When parallel rays are united exactly on the retina (A, Fig. 2) the eye is said to be normal. This condition is called *Emmetropia* (Greek, *en* within, and *metron*, measure, and *ops*, eye.) If the rays of light are focused behind or in front of the retina, the medical term *Ametropia* (Greek, *metron*, measure, and *opsis*, vision) is used, and of this there is two opposite varieties, viz: hypermetropia and myopia, or, far-sight and near-sight. Hypermetropia (Greek, *uper*, beyond, and *metron*, measure—*opsis*, vision) or far-sight may be defined as a condition in which the refractive power (cornea lens and vitrous humor) is so low, or the antero-posterior axis of the eyeball is so short, that parallel rays of light are brought to a focus behind the retina (Fig. 2, B.)

Distant objects cannot be seen clearly without a ( ) convex glass, or (what amounts to the same thing) a certain amount of accommodation. The finer the work, or print, and nearer the object, greater the strain upon accommodation, which, if continued, overtaxes the ciliary muscle (M. A. muscle of accommodation, Fig. 1) and produces Asthenopia—"Weak Eyes." It may also cause Strabismus—"Cross Eyes." This condition may be easily remedied by the proper adjustment of con-

vex lenses, which should be prescribed by an oculist. You may determine when one is far-sighted, (hypermetropic) from the following type; in a good light this fine print, if held near the eye, six or eight inches, is not read quickly, fluently, and without causing pain in the eye, or the letters will seem to run together.

After leaving both Myra we boarded the cars for London, Eng., a four thousand mile journey, via New York city. Upon reaching this American metropolis we called on our banker, who gave us a letter of credit, and the following day took passage for Liverpool on the steamer "Oregon." We were out eight days, and most of the passengers (428 in number) poured out libation to Neptune; yet some, when caught in the act, would positively deny being sea-sick. From Liverpool we went direct to London, and matriculated at the Royal London Ophthalmic Hospital. At odd times during our sojourn in this city of five million inhabitants, we visited such places as Westminster Abbey, The Tower, St. Paul Cathedral, Hyde Park, &c.

Far-sight (Hypermetropia) is a very usual cause of weak-sight, from the fact that an over-sighted eye must continually exert itself to focus rays of light at all distances, and in doing this is almost certain to over-use its accommodation. A convex ( ) glass, properly adjusted, relieves the excessive amount of accommodation, and the eye is rendered emmetropic or normal (A, in Fig. 1,) so that near work, reading, &c., may be accomplished with perfect ease and comfort to the eyes.

Myopia, or near-sight, is the opposite condition to that of far-sight, as its derivation implies (Greek, *muo*, to close, and *ops*, eye. It owes its name to the habit its victims oftentimes acquire, viz: of peering between the eyelids. This decreases the circle of diffusion, and only the parallel rays are allowed to enter the pupil, which improves their vision. The anterior-posterior diameter is too long in a near-sighted eye, (C. in Fig. 2) and in consequence of which parallel rays of light are focused in front of the retina (C. in Fig. 2.) The power of accommodation is of no use, in fact even worse than useless, as its function is to make the lens more convex, which of course would focus the rays of light still sooner, and increase the difficulty rather than help it.

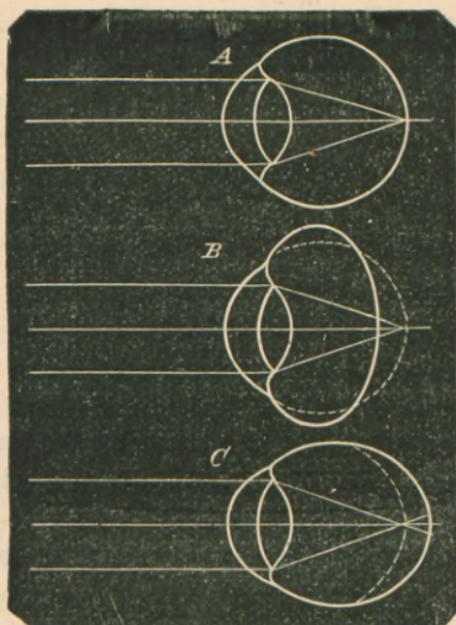


Fig. 2.

It is said by high authority that myopia, or near-sight, is one of the results of civilization and education, and in these days of high pressure and competitive examination, it is constantly on the increase. Myopia is almost unknown among the savage races, and the results of the very numerous statistics which have been collected, especially by German ophthalmologists (myopia in Germany is quite common) point to the production of near-sight in direct proportion to the amount of education. Statistics also show that near-sight is greater in town than in country schools. Cognizant of the above facts, it is with some reluctance that we concur that *hard study* is the main cause of this increased myopia; but we do say without the least hesitancy, that a combination of too much study, too much school, too continuous use of the eyes on near objects, (particularly fine objects, Greek and German letters,) too much improper light, rays of light

falling from the wrong direction, too little out door life, and use of the eyes in distant vision, are sufficient to cause near-sight, not mentioning hereditary influence.

Dr. Cohn has summarised the statistics of various German writers on hereditary tendency to near-sight. Thus, in public schools, near-sight was found to exist without predisposition in eight per cent., with predisposition in nineteen per cent. In the higher schools, the result was, without predisposition seventeen per cent., with predisposition twenty six per cent.; so it is quite evident that hereditary predisposition should be regarded as one of the causes that brings about or produces near-sight.

Another productive cause of near-sight is from reading five cents and dime novels, not that we are not pleased and edified with the plot, heroine, &c., but the print is generally poor, type very small, cheap paper, and oftentimes the reader is furnished with a poor light—that is to say, they devour the thrilling accounts and deeds of this cheap book while riding on a railway car, lying in bed, or stored away in some back room, where the light is very imperfect.

It is quite conceivable that we have described myopia or near-sight with more repletion than we did far-sight or hypermetropia, but knowing as we do, that myopic patients are not always anxious or willing to have their eyes refracted—that is to say, to have their near-sight corrected and the proper glasses adjusted, the inner tunics of the eye (L, V and R, in Fig. 1) are apt to be followed by serious changes, and oftentime leads to complete blindness, is our reason for so doing. Among those that have been constantly using proper glasses, this result is a very rare occurrence. If the error of refraction in a far-sighted eye is not corrected the patient may not be able to read, and the eyes may be a source of inconven-

ience, yet they are never entirely lost, as is oftentimes the case in near-sightedness. Elongation of the longitudinal fibres, resulting into what is known professionally as posterior staphyloma, the most injurious effect of near sight; later, exudative choroiditis with floating bodies, (black spots before the eyes) in the vitrous humor which oftentimes continues for the worse until all vision is irretrievably lost, and the victim is left as in Milton's soliloquy,

\*       \*       \*       \*       "But though  
 Revisitest not their Eyes, that roll in vain  
 To find thy piercing ray and find no dawn,  
 So thick a *drop serene* hath quenched their orbs  
 Or dim suffusion veiled."

#### THE OPHTHALMOSCOPE.

(Greek, *Ophthalmos*, Eye *Skopeo*, to look.)

Before the discovery of this valuable instrument, (only a few years ago) by Helmholtz, a disease of the optic nerve, of the vitrous humor, choroid and retina were hardly ever diagnosed, but considered under the generic name of Amaurosis (Greek, *amaourou*, to render obscure,) How different it is now—the disease of these parts, the inner tunics of the eyeball, are easier to diagnosticate, and no doubt their pathological changes are better understood, than those of any other portion of the body. This instrument is very simple indeed: it is merely a small mirror, with a hole through its centre. By reflecting light into the eye, and looking through the hole in the centre of the mirror, the optic nerve, choroid retina, &c., are as plainly seen as the reflected image of yourself from a mirror of your dressing case.

#### SYMPTOMS OF NEAR-SIGHT IN CHILDREN.

In children the symptoms of near-sight are frontal headache, or headache over the eyes. The eyes after

using them for awhile become red and painful; at school the child fails to see the figures on the blackboard across the room. Such eyes are not able to distinguish the letters numbered 20 at twenty feet. At a distance of

No. 20.

**F P L O.**

twenty four inches they are not able to read the fine type on page 7.

#### WHAT SHOULD BE DONE FOR NEAR-SIGHT?

If it be a young person, and attending school, the first thing to do is to stop school, give up reading and all near work; take plenty of out door exercise, and use the eyes for looking at distant objects only. After several weeks, or months, the improvement will cease, then have the eyes examined by an oculist, who will adjust the proper concave glasses, the weakest one that will give the most perfect vision. (Nine times out of ten the strongest is advised by those who do not properly understand refraction.) An honest optician does not care to take the responsibility, and will direct you to an oculist, who, after refracting the eyes properly, will advise you in regard to resuming the studies, &c. If the inner tunics of the eyes are diseased it is progressive, and of course it is advisable, to keep under proper medical supervision. If it be a case of non-progressive near-sight, the back of the eye normal, and requires a glass no stronger than No. 12 for its correction, the vision for distance, will improve as age advances, and at the age of sixty or seventy will no longer need glasses, which accounts for what almost every community furnishes—the old man or woman with “second sight.” In this so called second sight there is no essential rejuvenescence, as seems to be popularly believed.

## ASTIGMATISM OR PECULIAR SIGHT.

Astigmatism or Peculiar Sight is an error of refraction that we oftentimes meet. Unless thoroughly understood, it is quite difficult to correct; indeed I have corrected a case of mixed astigmatism that had been treated by a reputable oculist for inflammation of the optic nerve—quite a serious mistake in diagnosis.

This Peculiar Sight (Astigmatism) is rather complicated; too much so for the motive with which this is written, yet I will say that there are several varieties, viz.: near-sighted astigmatism, far-sighted astigmatism, mixed astigmatism and irregular astigmatism. In one form, half of the eye may be normal, the other half near-sighted; in another form, one half of the eye may be perfect, the other half far-sighted, and in mixed astigmatism one half of the eye is myopic (near-sighted) and the other half hypermetropic (far-sighted.) To correct peculiar sight, or astigmatism, it requires the proper adjustment of spherical glasses, combined with concave or convex cylindrical lenses ground according to the oculist's directions, and put in a frame at certain degrees designated by retinoscopy.

One suffering from astigmatism can neither see perfectly at a distance or near by. With an anatomical knowledge of the inner tunics of the eyeball, the error may be readily detected by the ophthalmologist, and when properly adjusted with cylinders or the combination of cylindrical and spherical lenses, vision is perfectly restored.

## PRESBYOPIA, OR OLD SIGHT.

Long or old sight is one of the first legion of troubles which advancing years brings upon all of us. Some times early (always the case in far-sightedness) though generally about the age of forty or forty-five, we notice

the failure of sight for near objects increases, particularly is this the case in the evening when we notice a desire for a good strong light in reading or in threading a needle, and in fine reading or sewing we are disposed to push further away from the eyes. This is no disease, but caused by a diminished power of accommodation, and senile changes in the lens (L, in Fig. 1)—it is very insidious, and creeps on us almost imperceptibly. The focusing point, as age advances, gradually recedes until we are unable to discern any small objects without the aid of convex ( ) glasses.

Donders, the renowned authority the world over on *accommodation* and *refraction* of the eye, says “the term presbyopia or ‘old sight’ is therefore to be restricted to the condition in which as the result of the increase of years the range of accommodation is diminished, and the vision of near objects is interfered with.” It is, as he remarked to the writer when in Eutrecht, Holland, “no more an anomaly than are grey hairs or wrinkling of the skin.”

#### WHEN OUGHT CONVEX GLASSES TO BE USED?

Is a question that is often asked. Just as soon as you notice that your focusing powers is receding, that is to say, when it is first noticed that the book or needle has to be pushed further from the eye than accustomed to, so soon should convex ( ) glasses be worn. Nothing is gained by waiting, and much may be lost. So soon as the early evening symptoms of old age are noticed, suitable glasses should be procured, and used for all near work, such as reading, sewing, painting, &c. To correct this trouble is very simple; any optician can furnish you with a convex ( ) glass, which will improve your vision. If the glasses should not perfectly suit, no material dam-

age is done, save an unpleasant drawing sensation in the eyes, which is corrected by the adjustment of a more suitable glass. I would advise, however, in selecting glasses for old sight to consult an oculist if convenient, if not, call on your optician, and procure the weakest convex ( ) glass which will enable you to read with ease the fine type on page 7 at ten or twelve inches from the eye. The following table is an approximation of the glasses required at the various ages after forty, but it cannot be strictly followed, as an existing over sight or near-sight with an old sight will require stronger or weaker glasses than those indicated in the table:

Age	Dioptres	Numbers in French inches	Numbers in English inches
45	1	36	40
50	2	18	20
55	3	12	13
60	4	9	10
65	4.50	8	9
70	5.50	6 $\frac{1}{2}$	7
75	6	6	6 $\frac{1}{2}$
80	7	5 $\frac{1}{2}$	5 $\frac{3}{4}$

With all due respect to the itinerant spectacle vender, (pardon me for saying,) when one comes along, asks you your age, and afterwards looks at your eyes in a way wondrous wise, remarks in a most pleasing manner "this is your number," do not be deceived, he has simply memorized the above table.

#### SPECTACLES, AND EYE-GLASSES.

For children who have near-sight or far-sight, the glasses should be put into conveniently fitting frames. Those who suffer or have astigmatism in any of its forms,

should invariably wear spectacles. In old sight it is better to use spectacles for all continuous work, still for occasional work glasses suspended around the neck by a cord are always at hand, and answer every purpose.

#### COLORED GLASSES.

If there is great dread of light, colored glasses are advisable; however, if not really necessary, it is better not to wear them, as the eye may become habituated to a subdued light—so much so that the eyes will become intolerant to ordinary day light. In bright sunlights, on the snow, white sand, or water, they may be profitably worn.

#### ARTIFICIAL EYES.

An artificial eye is made to fit over the stump or remains of an eye that has been lost by disease, or has been removed. It is simply a thin shell of glass, porcelain or celluloid painted in imitation of the natural eye, and when properly fitted are quite deceptive. They are inserted without pain, and the wearer is hardly conscious of its presence.

#### COLOR BLINDNESS.

[Chromo Pseudopsis.]

According to recent investigation, about six men out of every hundred are color blind; the power of distinguishing certain colors is either diminished or lost. For the normal eye there are only three elements of color, and that in the color-blind one of these is absent, these color perceptions are red, green and blue, these are the colors employed on railways to signal danger, &c., so it would appear that authorities should take care that locomotive engineers are free from color-blindness.

It will be well to remember the following rules.

## R U L E S .

If you need glasses, have your eyes refracted. Nothing is gained by waiting.

Hypermetropia, or far-sight, should be corrected with convex glasses, worn either for distance or near work.

Myopic, or near-sighted, persons should by all means have their eyes fitted with concave glasses.

All cases of astigmatism, or mixed sight, should be examined by an oculist, and the proper cylindrical glasses prescribed and worn constantly.

Presbyopia, or old sight, requires convex glasses, which should be invariably used for all near work.

Tinted glasses need to be worn only when there exists irritation or inflammation of the retina or of photophobia from various causes, as reflected light, myopia, etc.

Workmen sometimes require protectors which may be made of glass, tale or other material to keep off dust, fragments of stone, steel, etc.

Keep a ground glass shade on lamp or gas burner.

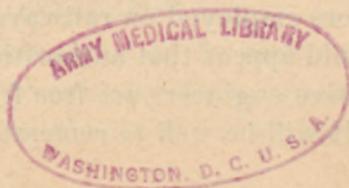
Avoid reading, writing or sewing in the gloaming or when it is difficult to see distinctly.

When your eyes are weary rest them, if they feel sandy or a disposition to rub them, you will know they need rest.

Don't face the light, but let the light come on your work from the side.

Avoid reading in sunlight or on a railroad train if your eyes are weak.

1418 Fourth Ave., }  
June 20, 1887. }



## EYE DISEASES,

### Most of which are Amenable to Treatment.

Blindness, Cataract, Cross-Eyes, "Watery-Eye," Amaurosis; "Cock-Eye." Amblyopia; Optic Neuritis—Inflammation of the optic nerve; Asthenopia—"Weak Eyes;" Far-sight, Near-sight; Various forms of Astigmatism; Atrophy of Optic nerve from use of tobacco, Catarrhalophthalmia, Granularophthalmar, Congestion of the retina, Chalazion, Choroiditis, Choroido-iritis, Color Blind, Glaucoma, Staphyloma, Tumor of the Orbit, Conjunctivitis; Foreign Bodies in the Eye, "Sore Eyes;" Ecchymosis—"Black Eye;" Pemphigus on Conjunctiva, Warts on lids and eyeball; Entropion—lids turned in; Epicanthus, Epiphora—Watery Eye; Ep'scleritis, Epitheleoma of eyelid and ball; Exophthalmus, Exudative-Choroiditis; Fibro, fatty tumors of the eye; Fluid Cataract, Fluidity of the Vitreous; Glioma of the Retina, Involuntary oscillation of the eyeball; Gonorrhœal Ophthalmia, Granula lids; Follicular Granulations; Papilliform Granulations, Gunpowder injuries; Hemiopia—half vision—half of an object seen only; Herpes Zoster frontalis; Homonymous diplopia, Hordeolum—Stye, Hyalitis, Hydrophthalmici, Hyperemia of the Retina, Injuries from lime, mortar, plaster, acids, small shot, percussion caps, &c.; Intraocular Tumors, Coloboma of the Iris; Iritis, gouty, primary, rheumatic, serous, syphilitic and traumatic; Keratitis, several forms; Lagophthalmus, Leucoma of the Cornea, Lippitudo, Meibomian Cyst, Melanotic Sarcoma of the Choroid, Miner's Nystagmus, Mucocœle; Muscæ Volitantes—floating specks before the eyes; Mydriasis, Myopia, Myosis, Nævus of the eyelid; Nephritic Retinitis, Neuro-retinitis, Nictitations, Nyctalopia, Onyx; Opacities in vitreous humor, lens, and cornea; Ophthalmitis, Papillitis, Paralysis ciliary muscle, the ocular muscles, fourth, sixth, and third nerve; Phlyctenula Conjunctivitis, Pinguecula, Posterior Staphyloma of Seleetic, Presbyopia, Prolaps of Iris, Proptosis, Ptosis, Pterygium, Purulent Ophthalmia of newly born infants, Contageous Ophthalmia, Retinal Apoplexy, Rodent Cancer of Lids, Scotoma, Sebaceous cyst, Serous Iritis, Short Sight, Snow-blindness, Soft Cataract, Sparking Synchrony, Spasm of ciliary muscle, Stricture of nasal duct, Symblephoran, Sympathetic Irritiation, Sympathetic Ophthalmia, Syphilitic Iritis, Tenæ Tarsi, Tobacco Amaurosis, Trachoma, Traumatic Cataract, Tremulous Iris, Trichiasis, Tubercles in choroid, Tumors of choroid; Ulcers of lids, cornea and ball—such as crescentic, nebulous, transparent, superficial rodent, syphilitic and sloughing; Xanthelasma palpebrum, Xerophthalmia, Xerosis, and many others.

