produces *apparent strabismus*, that is to say *the angle between the direction that an eye has in reality, and the direction it appears to have*.

The first of these two directions is the *visual line*, which unites the point fixal with the center of the fovea. The second is the *axis of the pupil*; for it is on the pupil that one sees (and not on the summit of the corneal ellipsoid, or on the optic axis of the eye which one *does not see*) that is based the apparent direction of an eye. (Think of how we judge the direction of the eyes in a portrait.)

It is this angle and not the angle alpha that in practice we easily de-

termine by the perimeter. (See Norris and Oliver's System of Diseases of the Eye, v. 4, p. 46.) It produces an apparent divergent strabismus when the pupillary axis passes outside (on the temporal side) of the visual line; or an apparent convergent strabismus when the pupillary axis passes to the inner (nasal) side of the visual line. I have given this angle the name of kappa. But I entirely disclaim the paternity of an angle alpha. There is only one angle alpha, i. e., the one of all those we have made a study of the dioptric system of the eye, and which is explained in the pages quoted from my work.

ERRORS IN OPHTHALMIC LITERATURE.

JAMES MOORES BALL, M.D.

ST. LOUIS, MO.

A number of the errors that are frequently repeated in ophthalmic literature are here pointed out and made the basis of a plea for more careful study of what has been published in the past, before putting forward ideas as new.

Somewhere, in his voluminous writings, Kipling has this virile couplet:

"The sins ye do, two by two,
Ye pay for, one by one."

The sins (errors) of ophthalmic writers do not run "two by two," and are not paid for.

Trifling as they may appear to be, they are not necessary, and they should be eliminated. The short cut to authorship tends to perpetuate errors which could be avoided if the literature were carefully studied. Precision and exactness are the watch dogs of ophthalmology—of its literature, as well as of its practical application to the diagnosis and treatment of disease.

In delving into the literature while preparing the manuscript for a new edition of a text-book, the writer has had two thoughts come to his mind:

1. The ancient is always old, but the *new* not always of recent origin; and,

2. Errors, as regards dates, facts, the spelling of names, the citation of references, etc., are handed down from one generation of ophthalmologists to another, without question.

The writer has not the time to elucidate, nor would it be advisable to consume the space in this JOURNAL to verify, the reasons for the *ex cathedra* statements which follow:

A. CONCERNING THE CILIARY MUSCLE. —In 1846, Ernst Wilhelm Brücke (1818-1892) described the ciliary muscle ("Ein neuer Muskel im Auge." *Med. Zeitung, Berlin*, 1846, XXV, 130). Probably he did not know that the muscular nature of this part of the eye, which had been suspected since the time of Eustachius (1520-1547), was first demonstrated microscopically, in 1835, by an American, William Clay Wallace of New York, who revived the name *ciliary muscle* which Eustachius had given to it (*Am J'l. of Sciences and Arts*, 1835, XXVII, 219-222). Even the deeper circular fibers were first mentioned by Wallace, altho the honor of their discovery is often credited to H. Müller.

B. ZEISS versus ZEIS.—Some years ago the writer called the attention of Professor Piersol to the fact that the sebaceous follicles lubricating the cilia, belong to *Zeis*, not *Zeiss*. Edouard

Zeis, of Dresden, in 1835, in von Ammon's *Zeitschrift für Ophthalmologie*, described these structures. Up to date, all books on anatomy and ophthalmology, with two or three exceptions, perpetuate the misspelling.

C. DOUGLAS ARGYLL ROBERTSON (1837-1909).—Argyll-Robertson, so far as can be ascertained, never lived. He is a myth. The pupillary sign, which is found so frequently in tabes, should be called, "the Robertson symptom." The hyphen is out of place.

D. SAEMISCH'S INCISION, which is mentioned in all ophthalmic text-books as of value in the treatment of *ulcus serpens*, was described, practiced, and published by G. J. Guthrie, in 1843—twenty-seven years before Saemisch wrote on the subject.

E. GALEZOWSKI REDIVIVUS.—The iris knife to which our instrument makers attach Dean's name, is described on page 443, and is pictured on page 444, of Galezowski's *Traité des maladies des yeux, troisième édition*, Paris, 1888.

F. IRIDOTASIS—BORTHEN, OR CRITCHETT.—Iris-inclusion operations for glaucoma, regardless of the danger of causing sympathetic ophthalmitis, seem to be attaining popularity. Except as concerns minor details, the writer fails to find wherein the procedure of Borthen (1909) differs from the operation which George Critchett, in 1857, performed in four cases of acute glaucoma. (*Royal London Ophthalmic Hospital Reports, vol. I.*)

G. CORNEO-SCLERAL TREPHINING FOR GLAUCOMA.—While his admirers attribute this procedure to Lieutenant-Colonel Elliot, doubtless that gentleman, if he could be heard, would give a different version of the origin of the operation.

Argyll Robertson—without the hyphen—in 1876, took Bowman's corneal trephine, added a roughened handle and a guard to limit its penetration, and trephined the sclera; later, he made a conjunctival flap and moved the instrument forward, so as to engage the corneo-sclera; and predicted, that the operation would give "an effectual means of reducing intra-ocular tension." (*Royal London Ophthalmic Hospital Reports, vol. VIII, part 3, May, 1876.*)

H. USE OF THE CAUTERY IN ULCERS OF THE CORNEA.—The surgeons of ancient and medieval days applied the cautery to all sorts of diseases. The use of the actual cautery in infected ulcers of the cornea belongs, not, as often has been stated, to Gayet of Lyons, but to our own Martinache, of San Francisco (*Pacific Medical and Surgical Journal*, November, 1873).

In his work on *Ophthalmic Surgery*, the late Charles H. Beard, of Chicago, said:

"Since the year 1873, when Martinache, of San Francisco, first called attention to its virtues in the treatment of *ulcers of the cornea*, the cautery has come to be a standard remedy for all such infectious diseases as serpent, fascicular, annular, dendritic and rodent ulcers, ulcerated wounds, and the ulceration incident to purulent ophthalmia."

I. ENUCLEATION OF THE EYEBALL.—The modern method of enucleating the eyeball, whereby there shall be the least sacrifice of other tissues without disturbance of Tenon's capsule, is credited by various ophthalmic writers to Bonnet, of Lyons, and to "Ferrall," of Dublin. As a matter of fact, the credit belongs to the Irishman, J. M. O'Ferrall (*Dublin Medical Journal*, 1841.).

J. CYCLICOTOMY.—At almost regular periods we are asked to consider a "new" operation for glaucoma, whereby the ciliary muscle is severed along with more or less adjacent tissue. Henry Hancock (1809-1880), in 1860, wrote "On the division of the ciliary muscle in glaucoma," and covered the subject thoroly.

K. PARACENTESIS IN CORNEAL ULCER.—In 1904, in advocating paracentesis of the cornea in cases of ulcer in which perforation seemed to be imminent, the writer said:

"If paracentesis is indicated in corneal ulcer, the opening should be made not thru the floor of the ulcer, as is usually advised, but, with care, a paracentesis can usually be made thru normal tissue, and infection should not follow." (*Modern Ophthalmology*, page 355).

Only recently did the writer learn that precisely the same advice had been given by Alfred von Graefe, in 1872.

L. SUCTION OPERATIONS FOR CATARACT.—The intracapsular extraction of cataract by means of a suction apparatus is now in the limelight; and not infrequently is credited to Barraquer, an eminent ophthalmic surgeon of Barcelona. While Barraquer has greatly improved the suction apparatus, and has employed it in more than one thousand extractions, the method belongs to an American. In 1910, Dr. Vard H. Hulen, then of Houston, Texas, now of San Francisco, reported six successful intracapsular extractions by the suction method (*Ophthalmic Record*, December, 1910). Barraquer published his first paper on this subject in 1917. It is to be hoped that the suction operation will not have to be thrown into the discard, because of loss of vitreous humor and detachment of the retina.

M. HYPEROPIA VERSUS HYPERMETROPIA.—Perhaps it is unnecessary to state that *hyperopia* (oversight), which seems to be firmly entrenched in our literature, is a less expressive word than *hypermetropia* (over-measure-of-sight); and that *chorioid* should be preferred to *choroid*. The dislocability of the English language is astounding.

Many other examples, like those which have been mentioned, might be cited of the errors which have crept into the literature of ophthalmology. However, it is not the writer's desire, to compile a complete list of "errors;" but, to command the attention of the reader, so that more careful study may be given to the preparation of the ophthalmic literature of the future.

In many respects we Americans are like the ancient Athenians whom Pericles addressed; and whose fateful Peloponnesian War was described, in masterful language, by Thucydides. We are new; often we are erratic; we are easily changed from positivism to nega-

tion; we are unduly sensitive; and most of us take ourselves too seriously. Doubtless we will improve with age. However, in spite of our defects, we still remain the one best hope of the world. Let us so conduct ourselves as to deserve the high position which the fortunes of war have cast in our direction.

In place of wildly striving to produce some modification in an operative procedure to which our names may be attached, the most of us might better serve our profession by a careful study of the writings of such dead giants as Donders, Snellen, Bowman, Helmholtz, Hutchinson, Liebreich, Bader, Hancock, Panas, Galezowski, Mackenzie, Critchett, and many others. One of the serious errors in our present-day ophthalmic literature is the ignorance, which many writers display, of the work which was done by those who have passed. Many hours would be saved, much useless experimentation would not be undertaken, and not a few hopes which are foreordained to end in bitter disappointment would be avoided, if the present generation only were wise enough to learn the history of the profession.

One of the pathetic things of life is this: that it seems to be impossible for the son to take up the burden at the point where the father, in the weariness of years, has laid it down. If the work of the masters were known, we would hear less of new operations and new discoveries.

The writer will now bring this paper to a close, by quoting what Elliot said five years ago, *in re* glaucoma:

"Those who have read, or who will read, patiently what von Graefe, de Wecker, Bowman, and many another giant of the past had to say on the clinical side of the subject, are bound to rise from their task in a chastened and humble frame of mind." (*Ophthalmoscope*, 1916, page 510).