

The Science of Optics.

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Entered according to Act of Parliament in the year 1896, by Lionel Laurance, at the Department of Agriculture.

Myopia.

[We regret that through some unfortunate blundering a portion of the manuscript for this article was mislaid and replaced by another portion which did not belong. This occurred on page 236, vol. IX. and the matter on page 260 should have preceded the greater part of that on page 236. The article will now however be found correct, and will be continued as heretofore.—Editor.]

To find the amount of Ac. exerted at any given distance by a Myope, 40 is divided by the distance, this gives the normal Ac. for the divergence of the rays, and from this number thus obtained the diopeters of M is deducted.

For instance in M 1D for seeing at 13 inches, Ac. of 2D is exerted because $\frac{40}{13} = 3D$, the normal Ac. for that distance; and 3D less 1D for the M makes 2D. If the distance be such that the Ac. that would be used by an Emmetrope, is equal to the extent of the M then none is exerted.

If the M exceeds it, then the point is beyond the PR and the Myope cannot see there at all.

The Myope has more Ac. in reserve within his PR than the Emmetrope has within his.

In M of say, 2D, the reserve quantity of Ac. that can be exerted between 20 in. (which is the PR in M 2D, and, therefore, the most distant point at which no Ac. is used) and the PP is:

	in M	2D	in Em
At 10 years of age	14D		12D
" 20 "	"	10D	8D
" 30 "	"	7D	5D
" 40 "	"	4.5D	2.5D
" 50 "	"	2.5D	0.5D

It is clear that at any point nearer than 20 inches the Myope of 2 Duses 2D less Ac. than does the Emmetrope, and he has for still nearer points 2D Ac. left in reserve, both of them having the same amplitude. So the myope can read nearer and see smaller objects than can the Emmetrope, with the M fully corrected, that is, with a pair of—2D special lenses, the Ac. for close work would be the same as Em. at any age.

The PP of the Myope is nearer than

that of the Emmetrope. At 20 years the amplitude being 10D.

In Emmetropia the PP is at	4 in.
In M. 1D	" " 3½ in.
In M. 2D	" " 3¼ in.
In M. 3D	" " 3 in.
In M. 4D	" " 2¾ in.
In M. 5D	" " 2½ in.
In M. 6D	" " 2½ in.
In M. 7D	" " 2⅓ in.
In M. 8D	" " 2¼ in.
In M. 9D	" " 2⅓ in.
In M. 10D	" " 2 in.

The above figures are found by adding to the amplitude the degree of the M and then dividing the total into 40. When younger the PP is nearer and when older it is farther away the same as in Em.

With the correcting lenses the PP is theoretically at the same distance as in Em., but it is frequently found further away in medium and high degrees of M, owing to the weakness and deficiency of the sphincter of the ciliary caused by non-use. Still the measurement of the PP is a useful sub test as when lenses are prescribed for constant use in medium degrees of M the PP with the glasses should be at about that same distance as in Em. In high degrees where the distance glasses are considerably reduced in strength for near work the measurement is of no use as reading is achieved really at the PR (with the lenses), or near to it.

Theoretically, also, the degree of M and its correction can be obtained by measuring the PP, but it is extremely vague for the reasons before given. Dividing the distance of the PP into 40, and deducting therefrom the amplitude of Ac. according to age, gives the degree of error, and the correction is the weakest — sph. that carries the PP away to that distance it would occupy in Em. Thus, if the PP be at 3 inches, the age being 30, then there is M 6D, and a — 6D will carry the PP from 3 inches to 5½ inches, where it should be at 30 years of age.

When a Myope is old, and his PP has receded considerably, it can arrive at and coincide with his PR, but cannot pass beyond it, but both the PP and the PR recede in old age.

Legislating Against Department Stores.

The following is the text of the Bill introduced by Mr. Middleton, in the Ontario Legislature but which only received its first reading and was withdrawn by request of the Premier.

BILL.

An Act respecting departmental stores.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. The council of any city or town may pass a by-law or by-laws for the purpose of imposing upon any departmental store carrying on more than three distinct classes of business, a special tax in respect of each additional class of business, and in imposing such business tax, the same may be regulated in and by the by-law so as to provide either a uniform tax in respect of each additional distinct class of business, or the same may be graded in such a manner as may seem proper; provided that no such by-law shall be passed or take effect under the authority of this Act without having been carried by a two-thirds vote of the members of the council present and voting.

"True to Principle."

We find in the Methodist Young People's paper *Onward* the following eminently true expression about the Canadian Press. We agree with *Onward* in saying that the press of Canada, taken for all in all, is as high-toned as that of any country in the world. Our readers will have no difficulty in recognizing the *Montreal Witness* as the paper specially referred to.

"Nowhere, we think, is there a press of higher moral tone than that of our beloved country. It possesses, we think, the unique distinction of having a leading journal in its largest city which for over fifty years has been a moral crusader, a champion of reform. In all that time it has not published one liquor, or tobacco, or theatrical advertisement. At the sacrifice of much money it has stood true to its high principle, and stands foursquare, a tower of strength, against all the winds that blow."

ACCORDING TO A MEDICAL WRITER children should have at least ten hours' sleep until they are 12 or 14 years of age, and up to the age of 18 or 19 nine hours is none too much.