PHYSICS

New Optical Glass Has Highest Light Bending Power

Made From Rare Elements Instead of Silica, New Glass Will Make Possible Faster Lenses for Cameras

A DISCOVERY which may be a major stride in the advance of photography and which permits lens makers to produce "faster" and better lenses has been made by Dr. George W. Morey of the Geophysical Laboratory of the Carnegie Institution of Washington.

The discovery of a way to make optical glass out of rare chemical elements instead of common silica permits the production of a glass which has a very high index of refraction and a low dispersion, it is disclosed in a patent, No. 2,150,694, just granted to Dr. Morey. This means a lens which serves the photographer more efficiently.

Some of the optical glasses of Dr. Morey have the highest index of refraction (light-bending power) ever reported; more than 2.00. Only comparable refraction is that of the diamond, which is about 2.41.

The optical properties of glass used in lenses have long limited optical lensmakers in the exactness of the work they could produce. Dr. Morey's discovery of a new kind of glass should remove this present limitation.

Out of the work should come lenses of greater light-gathering power which would be a boon to all miniature camera fans who ever seek greater apertures.

Moreover, high index of refraction and low dispersion permit better corrections for chromatic aberration, the annoying property of some lenses of bringing different colors to different focuses.

Chemical elements most people have never heard of are used in producing the glass. Yttrium, lanthanum, columbium, hafnium, tantalum, zirconium, strontium, boron, and barium are typical.

The aim of Dr. Morey is to produce a glass with an index of refraction (ability to bend light rays) of over 1.65. One glass, made of 60 per cent. lanthanum and 40 per cent. boron, has a refractive index of 1.72 and a dispersive index of 54.

Another composed of 33 per cent. lanthanum, 41 per cent. thorium and 26 per cent. boron has a refractive index of 1.76 and a dispersive index of 52.

As a comparison, ordinary flint glass of a lower refractive index (1.65) would have a dispersion of about 33. Small dispersion numbers mean high dispersion and vice versa.

The new work is a continuation of efforts made in America since the World War to produce better optical glass. At the time of the conflict, the United States found it had been buying most of its superior optical glass from Germany. Furious wartime research partially overcame the difficulty, but research has been going on ever since to make American optical glass equal or superior to any glass in the world. Dr. Morey's work is a contribution to this end. Patent rights to his discovery have been assigned to the Eastman Kodak Company.

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PSYCHOLOGY

Neglected Life Periods Are Below 6 and Over 60

TWO of the most critical periods of life, before six and after sixty, are not getting the attention they deserve. There have been old age movements that have kicked up considerable political sand because the advancing years do not remove the right to vote. The pre-school boys and girls are too young to form a political bloc.

The three or four years between infancy and the first grade constitute the most important interval in life for formation of character, temperament and intelligence. It might almost be logical

TYPICAL JOB

The microchemist must analyze the chemical composition of the corroded material on an electric light switch which made the lights go out in someone's home. The pencil points (left) to the tiny speck of material available. Tiny particles are loosened with acid and drawn up into a fine pipette (center) to be transferred to electrical sintering equipment (right) which burns off all combustible materials and purifies the remainder. All the photographs on this and the facing page are from the General Electric laboratory. The photograph on the cover of this week's SCIENCE NEWS LETTER is from a similar laboratory at Westinghouse.