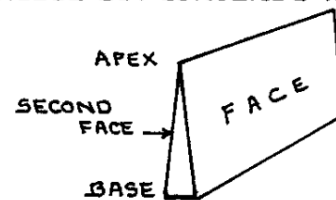


THE BASICS FOR UNDERSTANDING PRISMS AND LENSES

. PRISMS AND LENSES ARE PRESCRIBED BY OPHTHALMOLOGISTS (M.D.) OR OPTOMETRISTS (O.D.) FOLLOWING EXTENSIVE VISUAL MEASUREMENT TESTS, ALL OF WHICH ARE OUTSIDE OF THE BOUNDARIES OF PRACTICE OF OCCUPATIONAL THERAPISTS, PHYSICAL THERAPISTS OR VISION THERAPISTS.

. HOWEVER, UNDERSTANDING WHY PRISMS AND LENSES ARE USED AND WHAT THEY CAN ACHIEVE IN HELPING A PERSON SEE HIS/HER VISUAL WORLD IN A MORE NORMAL WAY, (SUCH AS PREVENTING EYE STRAIN, HELPING TO CORRECT TROPIAS, HIGH OR LOW PHORIAS, AMBLYOPIA, OR SHIFT SYNDROMES, ETC.) IS IN THE REALM OF KNOWLEDGE OF PRACTISING THERAPISTS. ALSO, YOU MAY HAVE A CLIENT THAT WEARS PRISMS OR NEEDS THEM, FOLLOWING A TBI OR CVA, AND IF YOU DO NOT UNDERSTAND THE BASICS OF PRISMS (OR LENSES) YOU MAY USE TREATMENT TECHNIQUES THAT ARE NOT BENEFICIAL TO YOUR CLIENTS NEEDS, AND/OR FAIL TO RECOGNISE THE VISUAL NEEDS OF YOUR CLIENT.

. PRISMS ARE 3 SIDED TRANSPARENT "PYRAMIDS" HAVING A BASE AND TWO FLAT SIDES OR FACES THAT ARE NOT PARALLEL BUT CONVERGE TOWARDS THE APEX OF THE PYRAMID \longrightarrow



. PRISMS COME IN MANY SIZES, SHAPES AND STRENGTHS:

. PRESCRIPTIONS SHOW THE LOCATION OF THE BASE AND APEX BY SYMBOLS:

\triangle BASE-DOWN OR BD

∇ BASE-UP OR BU

\triangleright BASE -OUT (LATERAL OR TEMPORALWARD) OR BO

\triangleleft BASE -IN (MEDIAL OR NASALWARD) OR BI

AND ALSO INDICATES WHICH EYE-GLASS IS TO BE GRIND ACCORDING TO THE PERSCRIPTION:

. LE = LEFT EYE OR O.S. = OCULUS SINISTER

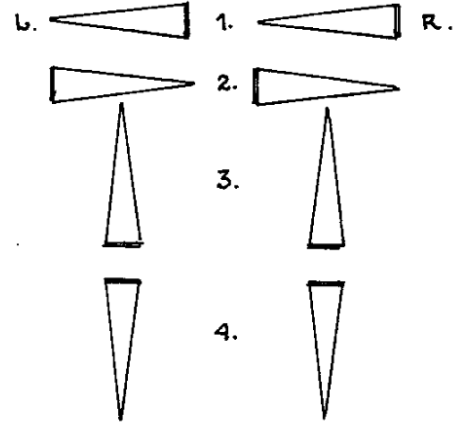
. RE = RIGHT EYE OR O.D. = OCULUS DEXTER

PRISMS - CONTINUED

.USUALLY, BUT NOT ALWAYS, PRISMS ARE GROUND INTO THE GLASSES (LENS) OF BOTH EYES

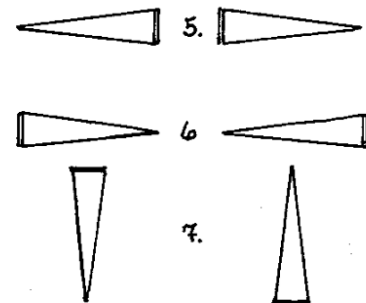
.PRISMS MAY BE YOKED (AKA. TANDEM)

.IE., BOTH BASES ARE ORIENTED IN THE SAME DIRECTION, - TO THE RIGHT (1.), TO THE LEFT (2), BASE-DOWN (3), OR BASE-UP (4).



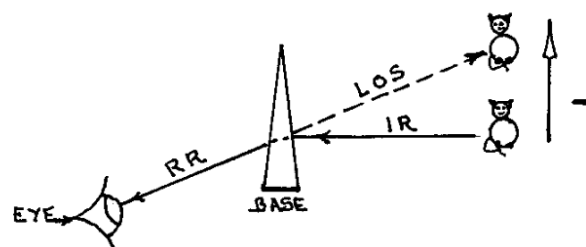
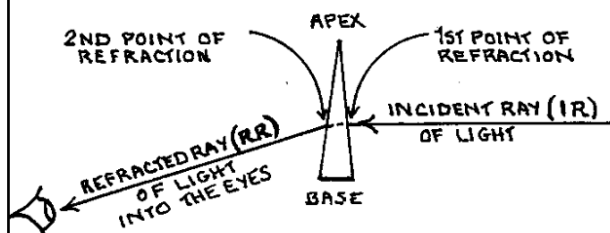
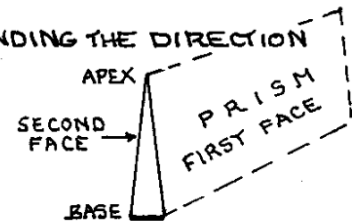
.PRISMS MAY NOT BE YOKED, I.E.,

THEIR BASES FACE "BASE-IN" (5) BASE-OUT (6) OR ONE LENS IS BASE-UP AND THE OTHER BASE-DOWN (7), OR ANY COMBINATION DEPENDING UPON THE NEEDS OF THE INDIVIDUAL.



.PRISMS REFRACT LIGHT: REFRACTION = CHANGING OR BENDING THE DIRECTION OF LIGHT AS IT PASSES THROUGH ONE FACE AND THEN THE SECOND FACE OF THE TWO SIDES OF THE PRISM.

.THE REFRACTED RAY [RR] EMERGING FROM THE SECOND FACE OF THE PYRAMID IS ALWAYS TOWARD THE BASE OF THE PRISM AND BECOMES THE NEW LINE OF SIGHT [LOS]



BASE-DOWN PRISMS ELEVATE OBJECTS IN SPACE (BASE-UP PRISMS LOWER OBJECTS IN SPACE)

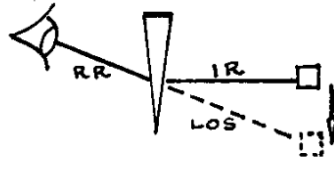
PRISMS... CONTINUED

BASE-DOWN YOKED PRISMS



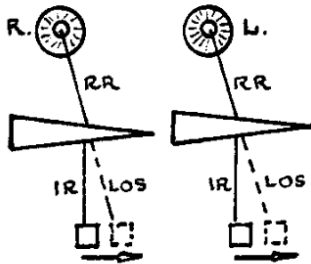
MOVES
OBJECTS
UP
IN SPACE

BASE-UP YOKED PRISMS



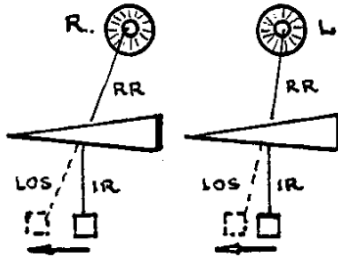
MOVES
OBJECTS
DOWN
IN SPACE

YOKED PRISMS BASES TO RIGHT



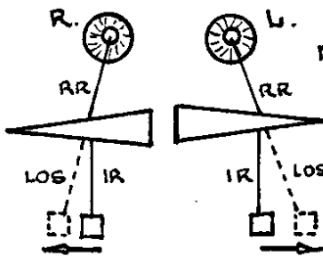
OBJECTS
ARE
SHIFTED
TO THE
LEFT

YOKED PRISMS BASES TO LEFT



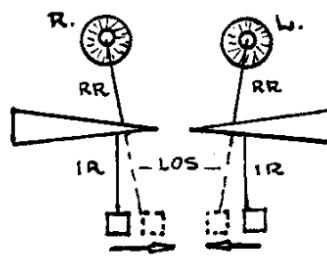
OBJECTS
ARE
SHIFTED
TO THE
RIGHT

BASE-IN PRISMS



MOVES OBJECTS
OUTWARD OR
AWAY FROM
THE
MIDLINE

BASE-OUT PRISMS



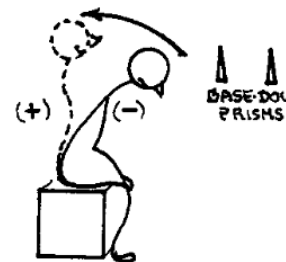
MOVES OBJECTS
INWARD OR
OR TOWARDS
THE
MIDLINE

THE BASIC FUNCTIONS OF PRISMS

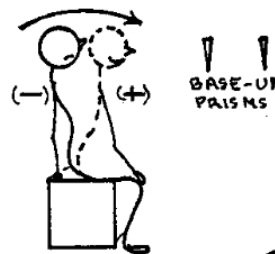
PRISMS CHANGE THE LINE OF SIGHT (LOS) OF THE EYES, AND CAN

- . MOVE THE EYES INTO THEIR CORRECT ALIGNMENT FOR BINOCULAR VISION, THUS ENABLING FUSION OF THE OBJECTS BEING VIEWED, AND
 - . CHANGE THE POSTURAL TONE OF THE PERSON, THUS ENHANCING HIS/HER HEAD-NECK AND BODY ALIGNMENT IN RELATION TO THE VERTICAL AND HORIZONTAL PLANES OF SPACE.
- YOKED PRISMS ARE USED FOR CHANGES IN POSTURAL SET OR BALANCE AND MUSCLE TONE.

BASE DOWN YOKED PRISMS MOVE OBJECTS UP IN SPACE. IN SO DOING THE VISUAL SYSTEM INTERPRETS THE ENVIRONMENT, AND ALL OBJECTS IN IT, AS BEING HIGHER OR MORE ELEVATED. SIGNALS FROM THE VISUAL SYSTEM TO THE NECK AND VESTIBULAR NUCLEI INFORM THESE CENTERS OF THE ELEVATED VISUAL PERCEPTION AND SIGNAL THE NECK AND BODY TO INCREASE EXTENSOR TONE AND DECREASE FLEXOR TONE, IN ORDER TO CHANGE THE HEAD-NECK AND BODY ALIGNMENT TO THE VISUAL WORLD.



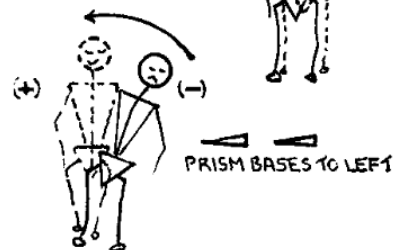
BASE-UP YOKED PRISMS DO THE OPPOSITE, I.E., INCREASE FLEXOR TONE AND DECREASE EXTENSOR TONE OF ALL BODY PARTS.



YOKED PRISMS BASES TO THE RIGHT SHIFTS HEAD-NECK AND BODY ALIGNMENT TOWARDS THE LEFT OR TOWARD THE MIDLINE, WHEN THE PERSON ORIGINALLY TILTED TO THE RIGHT.



YOKED PRISMS BASES TO THE LEFT SHIFTS HEAD-NECK AND BODY ALIGNMENT TOWARDS THE RIGHT OR TOWARD THE MIDLINE, WHEN THE PERSON ORIGINALLY TILTED TO THE LEFT.



PRISMS ALSO CHANGE THE SIZE AND SHAPE OF OBJECTS AND THE SURROUNDING SPACE:

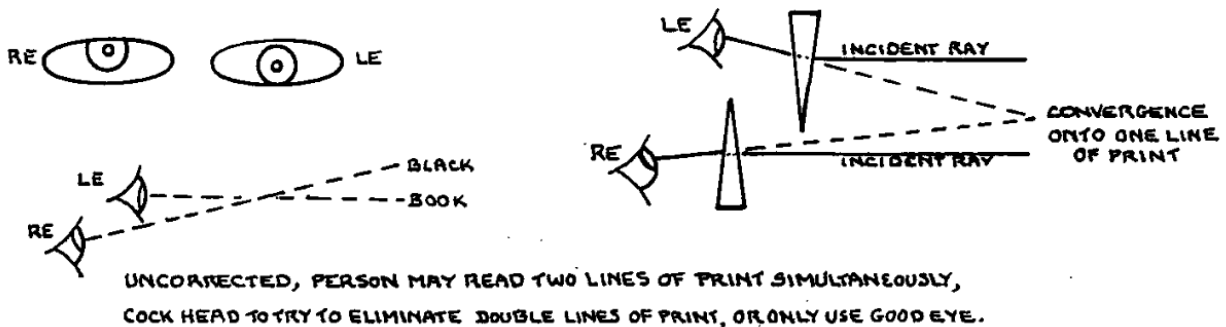
- . BASE-UP YOKED PRISMS MAKE OBJECTS APPEAR SHORTER, SMALLER AND NEARER, AND ARE SAID TO COMPRESS SPACE, I.E., A STRAIGHT HORIZONTAL LINE (LIKE THE HORIZON) BECOMES SLIGHTLY BOWED DOWNWARD AND TOWARDS THE VIEWER, BRINGING THE SPACE AT THE PERIPHERY IN TOWARDS THE VIEWER.
- . BASE-DOWN YOKED PRISMS MAKE OBJECTS APPEAR TALLER, NARROWER AND FARTHER AWAY AND ARE SAID TO EXPAND SPACE. HENCE A STRAIGHT HORIZONTAL LINE, LIKE THE HORIZON, SIDEWALK OR A FLOOR, BECOMES SLIGHTLY BOWED UPWARD AND OUT, AWAY FROM THE VIEWER. HENCE EXPANDING PERIPHERAL SPACE

PRISMS ARE USED FOR THREE MAIN PURPOSES

1. CORRECTING PRISMS :

- . THESE PRISMS IMPROVE EYE ALIGNMENT, VISUAL FUSION AND VISUAL ACUITY. (EXAMPLE BELOW.)
- . THESE PRISMS CAN PREVENT SUPPRESSION OF VISION IN THE DEVIATED EYE AND/OR PREVENT AMBLYOPIA = DIMNESS OF VISION IN THE INVOLVED EYE.

D V D = DISSOCIATED VERTICAL DEVIATION



2. YOKED PRISMS THAT CHANGE POSTURAL SET OR MUSCLE TONE IN THE HEAD-NECK & BODY

- . BASE-UP (OR BASE-DOWN) YOKED PRISMS ARE USED TO REALIGN HEAD-NECK AND BODY POSTURES IN RELATION TO THE ANTERIOR OR POSTERIOR VERTICAL PLANE OF SPACE. SEE ILLUSTRATION & EXPLANATION ON PAGE "THE BASIC FUNCTIONS OF PRISMS."
- . BASE-RIGHT (OR BASE-LEFT) YOKED PRISMS ARE USED TO REALIGN HEAD-NECK AND BODY POSTURES IN RELATION TO THE LATERAL (RIGHT OR LEFT) PLANES OF SPACE. SEE ILLUSTRATION AND FURTHER EXPLANATION ON PAGE "THE BASIC FUNCTIONS OF PRISMS."

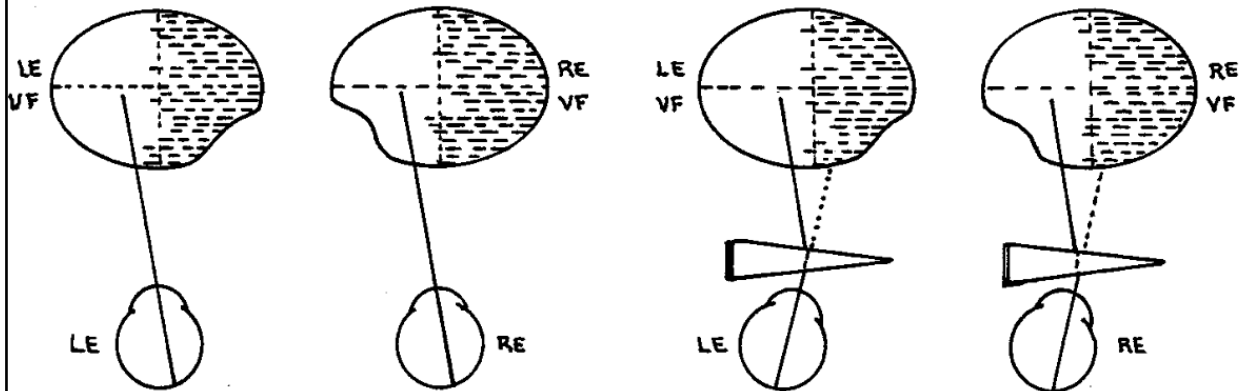
3. PRISMS THAT 'ELICIT-A-RESPONSE' IN THE VISUAL SYSTEM :

- . THESE KINDS OF HAND-HELD PRISMS ARE ONLY USED DURING THERAPY SESSIONS. HENCE, A PERSON DOES NOT WEAR THESE PRISMS OR USE THEM ON THEIR OWN.
- . ONLY A TRAINED VISION THERAPIST SHOULD USE THESE TYPES OF PRISMS, AS IT TAKES AN EXPERT TO UNDERSTAND HOW AND WHY THEY ARE USED AND WHAT A GIVEN CLIENT CAN GAIN DURING THE THERAPY SESSIONS.
- . BASICALLY THESE PRISMS CHANGE THE LINE OF SIGHT SUFFICIENTLY TO CAUSE THE NERVOUS SYSTEM TO ATTEMPT TO REALIGN THE DEVIATED EYE OR REDUCE THE AMOUNT OF DEVIATION AS LONG AS THE PRISM IS HELD IN FRONT OF THE EYE OR EYES.
- . FLIPPING OF THE PRISMS FROM BASE-DOWN TO BASE-UP (OR BASE-OUT TO BASE-IN), CAN BE USED TO EXERCISE THE EYE MUSCLES (BOTH THE INTRINSIC AND EXTRINSIC MUSCLES OF THE EYE BALL) SIMILAR TO EXERCISING ONE'S BICEPS MUSCLES DURING WEIGHT LIFTING, ALL OF WHICH HELPS THE NERVOUS SYSTEM RESPOND MORE APPROPRIATELY TO THE VISUAL SURROUND.

PRISMS CAN BE USED TO EXPAND THE VISUAL SPACE IN PERSONS WITH VISUAL FIELD CUTS OR DEFICITS

EXAMPLE A:

RIGHT HOMONYMOUS HEMIANOPSIA FREQUENTLY ASSOCIATED WITH A C.V.A.

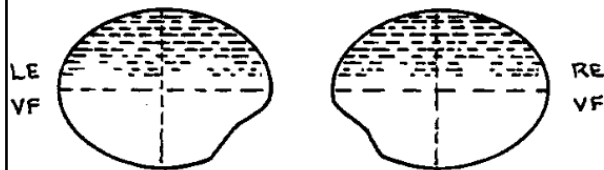


IN A VISUAL FIELD (VF) DEFICIT PERSON MAY OVER-ATTEND TO THE GOOD VIS. FIELD, MAY FAIL TO MOVE THEIR HEAD INTO THE "BLIND" VIS. FIELD, BECAUSE NO STIMULI ARE PERCEIVED BY THE VISUAL SYSTEM IN THE "BLIND" VISUAL FIELD.

BASE-LEFT YOKED PRISMS SHIFTS OBJECTS IN VISUAL SPACE TO THE RIGHT SO THAT THE PERSON SCANS INTO THE "BLIND" RIGHT V.F. THUS EXPANDING THEIR VISUAL SPACE. WITH PRISMS VISUAL SPACE CAN BE EXPANDED 20° TO 30° DEGREES OR MORE. [NOTE: BASE-RIGHT YOKED PRISMS WOULD BE USED FOR LEFT HOMONYMOUS HEMIANOPSIA.]

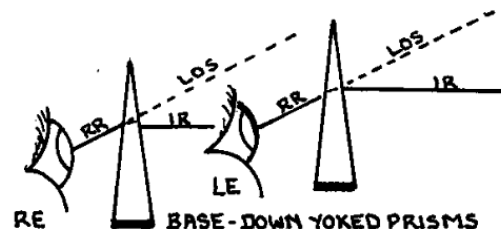
EXAMPLE B:

SUPERIOR HORIZONTAL VIS. FIELD DEFICIT FREQUENTLY ASSOCIATED WITH T.B.I.



INDIVIDUALS WITH SUP. HORIZ. V.F. LOSS MAY NOT BE AWARE OF THEIR DEFICIT. HOWEVER, IF THEY ARE CAPABLE OF DRIVING, THEY WILL FAIL TO SEE OVER-HEAD HIGHWAY SIGNS, SUSPENDED RED/GREEN SIGNAL LIGHTS OR STOP SIGNS. IF THEY ARE CONFINED TO A WHEEL-CHAIR MOST OF THEIR VISUAL WORLD IS LIMITED TO THAT WHICH THEY CAN SEE STRAIGHT AHEAD AND BELOW THE HORIZONTAL MIDLINE OF THEIR PUPILS.

IR = INCIDENT RAY OF LIGHT
 RR = REFRACTED RAY
 LOS = LINE OF SIGHT



BASE-DOWN YOKED PRISMS EXPAND VISUAL SPACE UPWARDS BY ELEVATING OBJECTS IN SPACE.