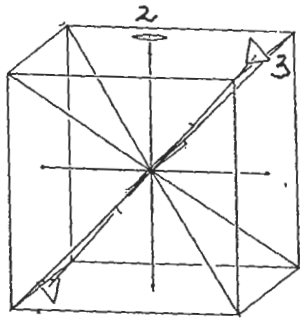
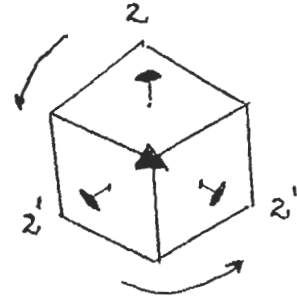


3.60 Symmetry, Structure and Tensor Properties of Materials

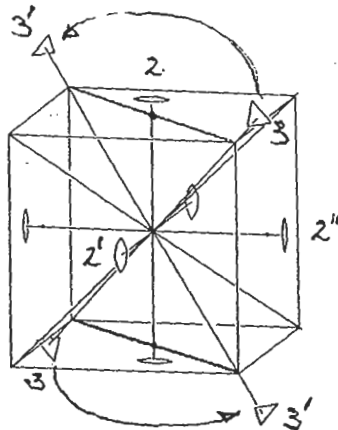
DEMONSTRATION THAT, IN POINT GROUP 23, THERE IS ONLY ONE INDEPENDENT 2-FOLD AXIS AND ONE INDEPENDENT 3-FOLD AXIS — THAT IS, IF ONE LETS THIS PAIR OF ROTATIONAL SYMMETRIES REPEAT EACH OTHER, ONE OBTAINS ALL OF THE REMAINING AXES.



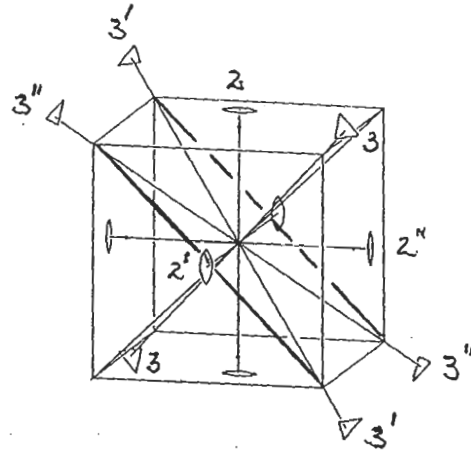
BEGIN WITH ONE 2-FOLD AXIS ALONG A FACE NORMAL AND ONE 3-FOLD ALONG A BODY DIAGONAL



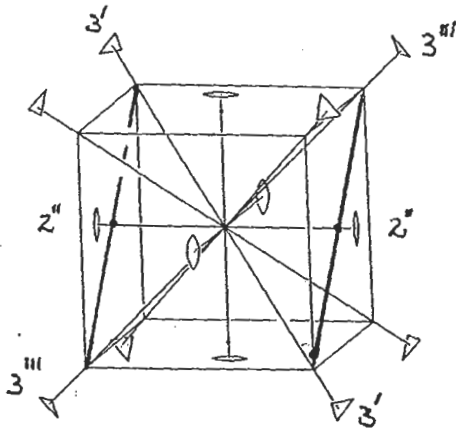
A CUBE WHEN VIEWED DIRECTLY ALONG ONE OF ITS BODY DIAGONALS LOOK LIKE THE ABOVE. ACTION OF THE 3-FOLD AXIS THEREFORE REPEATS 2 TO 2' AND 2''



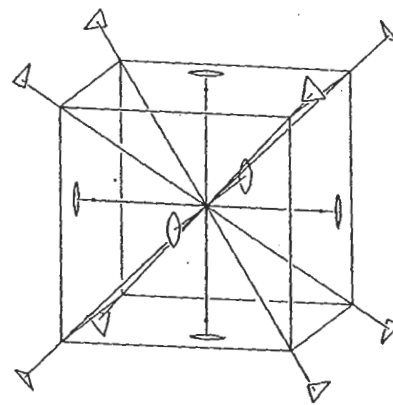
2 REPEATS 3 TO 3''



2' REPEATS 3' TO 3''



2'' REPEATS 3' TO 3'''



RESULT: STARTING WITH JUST ONE 2-FOLD AXIS AND A SINGLE 3-FOLD AXIS WE FINISH WITH A 2-FOLD ALONG EACH FACE-NORMAL AND A 3-FOLD AXIS ALONG EVERY BODY DIAGONAL