one can calculate the profile of implanted ion concentration at varying depths. As with any particles with charges, the electromagnetic lenses and beam scanner can be used to form practically any variation of ion concentration at the substrate, and particularly to form progressive zonal lens having the optical characteristics of FIGS. **6A** and **6B**. Similar results can be achieved by using masks of varied density. The vision corrective effect would correspond to that produced by the posterior surface undulations in the lens of FIG. **4**.

FIGS. **8A**, **8B** and **8C** show, respectively, a corneal inlay lens, a corneal onlay lens, and an intraocular lens, each incorporating the concepts of the present invention. In the corneal inlay lens **80** of FIG. **8A**, and in the corneal onlay lens **82** of FIG. **8B**, the illustrated progressive zonal variations are accomplished with the variable refractive index of lens material **84**, as described in conjunction with FIG. **7**.

In the intraocular lens **86** of FIG. **8C**, the posterior surface **88** is shown as an undulating surface having progressive zonal variations comparable to those in FIG. **4**.

Any of the three lens implants of FIGS. **8A**, **8B** or **8C** could use either the surface variations or the refractive index variations, and also could use either the anterior or posterior surface as the multifocal surface.

The implanted lenses of FIGS. **8A**, **8B** and **8C** are subject to the same problems as are the contact lenses, e.g., pupil size variations and decentration problems. The pupil size problems are essentially the same. The decentration problems are less pronounced with implanted lenses, but are nevertheless significant because operational procedures do not insure centration, and, in the case of intraocular lenses, postoperative movement can be quite noticeable.

From the foregoing description, it will be apparent that the apparatus and methods disclosed in this application will provide the significant functional, benefits summarized in the introductory portion of the specification.

The following claims are intended not only to cover the specific embodiments disclosed, but also to cover the inventive concepts explained herein with the maximum breadth and comprehensiveness permitted by the prior art.

What is claimed is:

1. An ophthalmic lens which is adapted to be carried by the eye and which has a surface providing variable vision correction power;

the correction power being caused to vary continuously and progressively from a first vision correction value to a second vision correction value and then back to the first vision correction value, passing through an intermediate vision correction value within each such continuous variation;

each cycle of such continuous variation from one value to the other and then back to the first being repeated in a plurality of zones starting near the center of the lens and continuing through progressively increasing distances from the center.

2. The ophthalmic lens of claim **1** in which the cross-sectional shape of its anterior and/or its posterior surface is an undulating curve which alternates smoothly between peaks and valleys, each peak and valley providing the intermediate vision correction value.

3. The ophthalmic lens of claim **2** in which the surface whose cross-sectional shape is an undulating curve is the posterior surface of the lens.

4. The ophthalmic lens of claim **2** in which the surface whose cross-sectional shape is an undulating curve is the anterior surface of the lens.

5. The ophthalmic lens of claim **2** in which the lens has at least two annular zones, each zone extending from one peak to the next peak, or from one valley to the next valley.

6. The ophthalmic lens of claim **1** in which both the anterior and posterior surfaces are arcuate, but at least one of them has a continuously and progressively varying index of refraction.

7. The ophthalmic lens of claim **6** in which the surface having the continuously varying index of refraction is the anterior surface of the lens.

8. The ophthalmic lens of claim **1** in which the lens is a lens adapted to be located on the surface of the eye.

9. The ophthalmic lens of claim **1** in which the lens is an implant lens adapted to be permanently retained within the eye.

10. An ophthalmic lens configured to be inserted in or onto an individual's eye in order to provide vision correction over a wide range of viewing distances, the lens comprising:

(a) a lens body having an optical axis and having an anterior face and a posterior face, one of said faces having first and second annular zones which are arranged in a concentric manner around said optical axis; and

(b) means for providing in each of said first and second zones a first region having a first vision correction power and a second region having a second vision correction power which is significantly different from said first vision correction power, the vision correction power between the first and second optical powers being progressive.

11. The ophthalmic lens of claim **10**, wherein the lens is configured as a contact lens to be worn on an individual's eye.

12. The ophthalmic lens of claim **10**, wherein the lens is configured as an intraocular lens to be inserted into an individual's eye.

13. The ophthalmic lens of claim **10**, wherein each of said first and second zones has a width which is smaller than a typical pupil diameter.

14. An ophthalmic lens configured to be inserted in or onto an individual's eye in order to provide substantially continuous vision correction over a wide range of viewing distances, the lens comprising:

(a) a lens body having an optical axis and having an anterior face and a posterior face; and

(b) means for providing on one of said anterior or posterior faces, concentrically relative to said optical axis, a generally repetitive pattern comprising a number of radially outwardly alternating, annular regions or high and low vision correction powers, said regions of high and low vision correction powers being interconnected in an optical sense by transition regions, each of said transition regions having a range of progressive intermediate vision correction powers between the high and low vision correction powers.

15. The ophthalmic lens of claim **14**, wherein the regions of high, low, and intermediate vision correction powers are formed by varying the physical curvature of said lens face in an appropriate manner.

16. The ophthalmic lens of claim **14**, wherein said lens face comprises at least four generally annular regions of high optical pwers and at least four generally annular