

INDEX TO VOLUME IV.

[The references are to pages.]

- Absorption of light, mechanism of, 69; Appendix, 376.
- Achromatism of double object glass, theory of, 63, 350.
- Achromatism, practical investigations, 337; test of, in telescope, 357.
- Acids, action on quinine, 328.
- Attraction, discontinuity at surface layer, 281.
- Bessel functions, relations between constants in expansions by, 100, 286; of integral order, 294, applied to aerial waves, 316.
- Biliverdin distinguished from chlorophyll, 296.
- Blood, oxidation and reduction of, 264, 272.
- Cauchy, A. L., on double refraction, 170; on metallic reflection, 363.
- Chestnut bark, new constituent of, 112, 119.
- Chlorophyll, constitution of, 237, 247, 260.
- Chromatic aberration, correction of secondary, 348.
- Colours, nature of compound, 65; origin of natural colour, 153, 243; body colour of loose powder, 263.
- Complex integration along different paths, 93, 287.
- Convergence, limited, of series, 80.
- Cooling, deformations due to rapid, 234.
- Degradation of light, 4.
- Diamond, reflection from, 363.
- Diffraction light, polarization of, 74; determines direction of vibration, 117.
- Discontinuity in constants occurring in expansions in series, 80, 282.
- Dispersion, false, of light by small particles in glass, 244.
- Divergent series, discontinuity in use of, 80, 289.
- Double refraction, report on theories of, 157; experimental test of its laws, 336, 337.
- Dynamical paradox explained, 334.
- Elastic theories of the aether, 157.
- Electric discharges, optical constitution of, 226; difference between the two electrodes, 231.
- Electric telegraph, theory of signalling, 61.
- Enclosure, radiation belonging to temperature, 136.
- Equilibrium of gases in blood, 274.
- Equipotential curves cross at equal angles, 276.
- Eye, chromatic aberration of, 59.
- Fluorescence, methods of observation, 1, 326; history of, 18; applied to spectrum, 207; preparation of screen, 208; striated in minerals, 222; as chemical test, 256; connexion with absorption, 258; action of acids on quinine, 13, 327; of chestnut bark, 110, 119; theoretical, 246.
- Foucault, L., on absorption of *D* lines, 130, 134, 374.
- Fraunhofer, J., his achromatic combinations, 63; on spectra, 368.
- Fresnel, A., on double refraction, 157 *seq.*; theory of pile of plates, 145.
- Glasses, relation of optical quality to composition, 339; titano-phosphatic suitable for achromatizing objectives, 356, but not titano-silicic, 358.

- Gravity, theory of Harton pit experiment, 70.
- Green, G., on elastic propagation and double refraction, 172.
- Haematin, 271.
- Haemoglobin, 240; its reactions, 264.
- Haidinger, W., letter to, 50; his brushes, 60.
- Hankel, H., on Bessel functions, 80.
- Harcourt, Rev. W. V., researches on glasses, 339 *seq.*
- Hydrogen atmosphere stifles sound, 300.
- Hyposulphurous acid, nature of, tested by quinine, 331.
- Kelvin, Lord (Thomson, W.), on beginnings of spectrum analysis, 132, 135, 367; on cable telegraphy, 61.
- Kirchhoff, G., on spectrum analysis, 123, 136.
- Limit, mathematical, approached different ways, 88.
- MacCullagh, J., theory of double refraction, 177; of metallic reflection, 363.
- Madder, optical analysis of, 123.
- Mass, general distribution producing given external gravity, 277.
- Metallic reflection of crystals, 16, 38, 244; complementary to absorption. 43, 243; verified on absorption bands of permanganate, 46, 261.
- Metallic reflection, peculiarity of Newton's rings by, 361; silver transparent in ultra-violet, 206.
- Miller, W. H., on coincidence of *D* and sodium lines, 370, 372.
- Newton's rings by metallic reflection beyond the critical angle, 361.
- Object-glasses, chemical correction of, 344; triple perfect achromatic, 356, 358.
- Optical properties as tests for organic bodies, 238, 249; of glasses, 339.
- Photographic lenses, correction of, 344.
- Platino-cyanide crystals, dichroic, polarized fluorescence, 16; solutions inactive, 17.
- Polarization produced by pile of plates, theory, 145.
- Polarized optical rings, peculiarity in photographs, 30.
- Prisms, compensating, for investigating dispersion, 341.
- Quinine, metallic reflection of a salt of, 19; influence of various acids on its fluorescence, 13, 328.
- Radiation, law of exchanges, 129; verified for polarized radiation of tourmaline, 136; theoretical verification for internal radiation in crystals, 137.
- Realization of constant-temperature radiation, 136.
- Series, semi-convergent, discontinuity in constants, 77, 282.
- Shadow-patterns, 55.
- Solar eclipse, appearance at horns of crescent, 325.
- Sounding-boards, necessity for, 300.
- Spectroscope, curvature of images in, 355.
- Spectrum analysis, history of, 127; Appendix, 367; may transcend chemical analysis, 373.
- Spectrum, ultra-violet, 28; long, of electric light, 203; of metals, 210; absorption, of organic bodies, 216; relation of intensities of lines to temperature, 365.
- Stewart, Balfour, on law of exchanges of radiation, 136, 375; verified for tourmaline in enclosure, 136.
- Telegraphy, submarine, 61.
- Transition-films, in reflection of light, 364.
- Tuning-fork, mutual interference of prongs, 324.
- Uranium salts, fluorescent, 209, even when pure, 220.
- Vibrations, communication to a gas, 299, from a sphere, 303, from a cylinder, 314.
- Vibrations, direction of, in polarized light, 50.
- Wind, effect on sound, 110.