Ozone forms naturally in the stratosphere, through photodissociation of oxygen by UV. O3 is believed to have played a key role in the evolution of the atmosphere and the development of life on Earth. By intercepting biologically-damaging radiation, ozone controls the flux of UV at the surface, exposure to which is significantly correlated to the incidence of skin cancer. Ozone is also radiatively active in the IR, making it a contributor to the greenhouse effect. Like other trace gases, ozone is highly variable. During winter, ozone column abundance (total ozone) increases at middle and high latitudes – by almost 100%. The large seasonal increase in hemispheric overburden derives from a gradual meridional overturning. Known as the residual circulation, or Brewer-Dobson circulation, this meridional overturning transports air from the tropics, where O3 is produced photochemically, to the winter pole, where almost no O3 is produced yet total ozone is greatest. The residual circulation also maintains temperature over the winter pole, shrouded in darkness, far warmer than it would be under radiative equilibrium. Temperature and ozone each vary significantly from winter to the next. Chiefly random, those interannual changes have been studied extensively in recent years, especially for the Northern Hemisphere. They are shown to track anomalous forcing of the residual circulation, changes that are transmitted upward from the troposphere by planetary-scale waves. Interannual changes over the Southern Hemisphere are shown to obey a similar relationship. So do changes of chlorine activation, which is responsible for chemical destruction of ozone over the polar caps, in particular, for the the Antarctic ozone hole that forms each year during Austral spring. These interannual changes in the stratosphere are shown to be accompanied by coherent changes in the troposphere. They share major features with the so-called Arctic Oscillation, which has been linked to signatures over the Northern Hemisphere of global warming, and with its counterpart over the Southern Hemisphere, the Antarctic Oscillation. Each reflects inter-dependent changes in the stratosphere and troposphere, which are coupled by the residual circulation through exchanges of mass.