the Andes.* In descending toward the South Sea, from Caxamarca toward Guangamarca, I have observed vast masses of quartz, from 7000 to 8000 feet in height, superposed sometimes on porphyry devoid of quartz, and sometimes on diorite. Can these beds have been transformed from sandstone, as Elie de Beaumont conjectures in the case of the quartz strata on the Col de la Poissonnière, east of Briançon ?† In the Brazils, in the diamond district of Minas Geraes and St. Paul, which has recently been so accurately investigated by Clausen, Plutonic action has developed in dioritic veins sometimes ordinary mica, and sometimes specular iron in quartzose itacolumite. The diamonds of Grammagoa are imbedded in strata of solid silica, and are occasionally enveloped in laminæ of mica, like the garnets found in mica slate. The diamonds that occur furthest to the north, as those discovered in 1829 at 58° lat., on the European slope of the Uralian Mountains, bear a geognostic relation to the black carboniferous dolomite of Adolffskoi‡ and to augitic porphyry, although more accurate observations are required in order fully to elucidate this subject.

Among the most remarkable phenomena of contact, we must, finally, enumerate the formation of garnets in argillaceous schist in contact with basalt and dolerite (as in Northumberland and the island of Anglesea), and the occurrence of a vast number of beautiful and most various crystals, as garnets, vesuvian, augite, and ceylanite, on the surfaces of contact between the erupted and sedimentary rock, as, for instance, on the junction of the syenite of Monzon with dolomite and compact limestone.§ In the island of Elba, masses of serpentine, which perhaps nowhere more clearly indicate the character of erupted rocks, have occasioned the sublimation of iron glance and red oxyd of iron in fissures of calcareous sandstone.‖ We still daily find the same iron glance formed by sublimation from the vapors and the walls of the fissures of open veins on the margin of the crater, and in the fresh lava currents of the volcanoes of Stromboli, Vesuvius, and Ætna.¶ The veins that

* Humboldt, *Essai Geogn. sur le Gisement des Roches*, p. 93; *Asie Centrale*, t. iii., p. 532.

† Elie de Beaumont, in the *Annales des Sciences Naturelles*, t. xv., p 362; Murchison, *Silurian System*, p. 286.

‡ Rose, *Reise nach dem Ural*, bd. i., s. 364 und 367.

§ Leop. von Buch, *Briefe*, s. 109–129. See, also, Elie de Beaumont *On the Contact of Granite with the Beds of the Jura*, in the *Mém. Géol.* t. ii., p. 408.

‖ Hoffman, *Reise*, s. 30 und 37.

¶ On the chemical process in the formation of specular iron, see Gay