

The foregoing table being constructed on the same principle as No. III requires but little explanation. It has been our object to include and arrange in it all the altered rocks and even some of somewhat doubtful character. As in former tables no new names have been invented, and only in the case of argillaceous mica slate and phyllite have synonyms been so applied as to indicate two different rocks. The former of these terms is applied to the siliceous and the latter to the silicic rocks of the series of slates to which they belong.

The principal accessorial constituents of original rocks appear to be but very slightly subject either to weathering or alteration. Topaz, tourmaline, crysoberyll, beryll, corundum, chromite, ilmenite, zircon, diamond, gadolinite, perovskite, garnite, spinelle, tinstone, rutile and many others are, chemically, almost indestructible minerals. Many of them possess a hardness equal to and sometimes exceeding quartz, resist chemical decomposition as well as it, and are found accompanying it among the ruins of rocks in the sands of rivers and sea shores. Most of this indifference is attributable to their extremely dense and crystalline nature, and perhaps also to their peculiar chemical composition, for, although many of them are basic, their components are such as are but little influenced by atmospheric agencies. Many of these accessorial minerals which seldom exhibit decomposed surfaces, such as garnet, epidote and tourmaline, are nevertheless said to give rise to the formation of other minerals by their alteration. This is owing to the occurrence of the latter in forms belonging to the former minerals, but in some cases it may be doubted whether the proof of alteration is sufficient. The gradual change of the garnet or tourmaline into the supposed new mineral is not always traceable, and the latter being frequently very crystalline and anhydrous, bears very little resemblance to an altered mineral. These remarks apply to the alleged change of beryll to mica, tourmaline to chlorite, leucite to saundine, garnet to specular iron ore, epidote to potash mica and others recorded by Senft. On the other hand allanite, leucite, haüyite, sodalite and others, have been found on analysis to contain water and to have undergone hydration and other changes. Cordierite and scapolite are the principal occasional minerals of original rocks which have been very thoroughly altered. The number of new minerals to which they are said to have given rise is very remarkable. Senft mentions prasecolite, esmarkite, aspasiolite, bousdorffite, fahlunite, weissite, gigantolite, pinite and potash mica as pro-