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fically any of the characteristics defined by these three methods of examination, either with the temperatures of rolling here observed or with each other.

The following thermal properties of these rail steels were determined in the laboratory: The critical range on heating is located (maximum) to within 7°C. of 732°C. (1350°F.) for the 10 samples of O.H. and Bessemer steels examined. On cooling, the critical range lies between the limits 680°C. (1256°F.) and 650°C. (1202°F.). The melting or freezing range for rail steel extends from about 1470°C. (2680°F.) to nearly the melting point of iron, located at 1530°C. (2786°F.).

The expansion for O.H. and Bessemer steels is not the same. Above 800°C. (1470°F.) the expansion for both increases linearly with temperature, and the linear coefficient per degree centigrade has the following mean values between 0° and 1000°C.:

- (1) For Bessemer Steel (Carbon .40 to .50 per cent):  $\alpha = 0.0000146$
- (2) For Open Hearth Steel (Carbon .65 to .70 per cent):  $\alpha = 0.0000156$  to 0.0000161.

The average composition of the Bessemers was carbon = 0.40 to 0.50 and maganese = 0.76 to 0.93; of the Open Hearths, carbon = 0.65 to 0.70 and manganese = 0.66 to 0.72.

In 1909 the American Society for Testing Materials limited the shrinkage allowance on 100 lb. sections to  $6\frac{3}{4}$  inches in 33 feet, or to an equivalent of 1947°F. (1064°C.) for O.H. and 2055°F. (1124°C.) for Bessemer rails, a specification which is still in force. Such a shrinkage clause, therefore, does not serve the avowed purpose of limiting the finishing temperatures to a value slightly above the critical range.

MINERALOGY.—*Mineralogical notes, Series 3.* WALDEMAR T. SCHALLER, U. S. Geological Survey.

A bulletin with this title has been submitted for publication by the U. S. Geological Survey. In order to secure priority, the following very brief abstracts are given of the original papers:

*Koehlinite (Bismuth Molybdate), A New Mineral* from Schneeberg, Saxony, is named after Dr. RUDOLF KOEHLIN of Vienna. The orthorhombic ( $a : b : c = 0.9774 : 1 : 1.0026$ ) crystals are

thin tabular parallel to  $a\{100\}$ . Formula:  $\text{Bi}_2\text{O}_3 \cdot \text{MoO}_3$ . *Inyoite and Meyerhofferite, Two New Calcium Borates* from Death Valley, Inyo County, California, belong to the colemanite series. *Inyoite* (named after the locality) occurs in rhombic-shaped monoclinic crystals ( $a : b : c = 0.9408 : 1 : 0.6665$ ,  $\beta = 62^\circ 37'$ ). The formula is  $2\text{CaO} \cdot 3\text{B}_2\text{O}_3 \cdot 13\text{H}_2\text{O}$ . The *inyoite* crystals alter to aggregates of prismatic crystals of *meyerhofferite* (named after W. MEYERHOFFER, who made the mineral artificially), which is triclinic ( $a : b : c = 0.7923 : 1 : 0.7750$ ,  $\alpha = 89^\circ 32'$ ,  $\beta = 78^\circ 19'$ ,  $\gamma = 86^\circ 52'$ ) and which has the formula  $2\text{CaO} \cdot 3\text{B}_2\text{O}_3 \cdot 7\text{H}_2\text{O}$ . *Lucinite a New Mineral: A Dimorphous Form of Variscite*, occurs with variscite at Lucin, Utah, in minute octahedral orthorhombic crystals.

Lucinite,  $a : b : c = 0.8729 : 1 : 0.9788$

Variscite,  $a : b : c = 0.8944 : 1 : 1.0919$

Analyses show the two minerals to have the same composition. *The Crystallography of Variscite* includes a redetermination of the axial ratio (just given) and an extension of the crystal forms. *Schneebergite*: A study of original material from Schneeberg, Austrian Tyrol, loaned by DR. KOECHLIN of Vienna, has shown it to have the formula  $4\text{CaO} \cdot \text{Sb}_2\text{O}_3 \cdot \text{Sb}_2\text{O}_5$ , the antimony being present in two states of oxidation. Schneebergite is distinct from all other calcium antimony compounds. *Romeine* from Italy has the formula  $5\text{CaO} \cdot 3\text{Sb}_2\text{O}_5$ . The so-called atopite from Brazil is not that mineral but romeine. *The Natural Antimonites and Antimonates* are briefly classified. *Velardeñite, a New Member of the Melilite Group*, is tetragonal, and has the composition  $2\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{SiO}_2$ . The so-called gehlenite from Velardeña, Mexico, is velardeñite. *The Melilite Group* of minerals can be interpreted as mixtures of velardeñite, sarcolite ( $3\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot 3\text{SiO}_2$ ), and äckermanite ( $4\text{MgO} \cdot 8\text{CaO} \cdot 9\text{SiO}_2$ ). *The Crystallography of Thaumassite* describes hexagonal crystals,  $c = 1.09$ . *The Chrysocolla Group* discusses the minerals commonly called chrysocolla which are shown to belong to several distinct crystallized species. *The Chemical Composition of Tremolite* is considered from the chemical side and the probable formula derived for the mineral is  $\text{H}_2\text{O} \cdot 2\text{CaO} \cdot 5\text{MgO} \cdot 8\text{SiO}_2$ . *The Probable Identity of Mariposite and Alurgite* is considered, and *The Amblygonite Group*

of *Minerals*: *Fremontite* = *Natramblygonite* withdraws the name *natramblygonite* and substitutes for the mineral  $\text{Na}(\text{AlOH})\text{PO}_4$  the name *fremontite*, after Fremont County, Colorado.

BOTANY.—*Acacia cornigera* and its allies. WILLIAM EDWIN SAFFORD, Bureau of Plant Industry.

In the course of a recent study of the myrmecophilous Acacias in the U. S. National Herbarium the author encountered a number of undescribed species, some of which differ fundamentally from any hitherto known. Much confusion was found also in the existing classification of these plants, due largely to the fact that, in describing species, the early authors had failed to designate definite types. Thus, under *Acacia cornigera* (*Mimosa cornigera* L.) several distinct species were cited by Willdenow as possible synonyms, a fact which was recognized by Schlechtendal and Chamisso in their study of certain specimens collected in Mexico by Schiede. But these authors in turn included under their *Acacia sphaerocephala* two, if not three species, one of which has recently been described by Dr. Heinrich Schenck, of Darmstadt, under the name *Acacia veracruzensis*. To make the confusion still greater, Bentham in his Revision of the Mimoseae,<sup>1</sup> "re-described" *Acacia sphaerocephala* and *A. spadicigera* but applied these names to species quite distinct from those so-called by Schlechtendal and Chamisso, while he dropped *Acacia cornigera*, a species distinct from both *A. sphaerocephala* and *A. spadicigera*, based upon a plant growing in the garden of George Clifford, a specimen of which exists in the Linnaean Herbarium (no. 4). The synonyms cited by Bentham are even more heterogeneous than those of Linnaeus.

The absence of flowers and fruits from the specimens of myrmecophilous Acacias described by the early botanists has been the chief cause of the mistakes of later authors. Fortunately the material in the U. S. National Herbarium includes specimens of fruits as well as of flowers of nearly all the species. The present writer recognized the fact that these fruits, which are of several distinct forms, offer a means of separating the species into a

<sup>1</sup>Trans. Linn. Soc. Lond. 30. 1875.