and acetylene continues to attract much attention. Ten French factories are now making calcium carbid and four more are being built, and it is said two French villages are lighted wholly by acetylene gas, at a cost of 50 per cent. less than coal gas. On the other hand, Welsbach is making improvements in his burner, and Nernst gives hope of a yet more brilliant and economical source of light, as has already been described in the columns of SCIENCE. In conclusion, Dr. McMurtrie says: "In every direction industrial progress is suggestive, and we may expect advancement in all directions with increasing intensity. Commercial artificial indigo, commercial artificial silk, commercial mercerized cotton in its various forms, the new colors and medicinal substances from carbon compounds, new concentrated nutritive substances, synthetic albumen, the various toxins and extracts of animal matters of therapeutic value, all claim a large share of attention; and so do hundreds of other substances and processes in which the principles of chemistry find application to human needs."

IN the Italian *Gazetta* Rebuffat contributes an exhaustive study of hydraulic cements. These he divides into two classes: (1) amorphous, compact cements, which consist of lime, calcium orthosilicate and calcium aluminate, in which, however, the free lime may be wanting; this class contains the hydraulic limes and quick settling cements. (2) Crystalline cements, consisting of a crystalline compound of calcium orthosilicate and lime, with a varying quantity of calcium aluminate; this class contains Portland cements and those rich in silica. After hardening, however, all these cements have the same qualitative composition, consisting of a mixture of calcium hydrate, hydrated calcium silicate of the formula $2(SiO_2, 2CaO), H_2O$, and hydrated calcium aluminate, with a small amount of inert matter. In cements rich in silica a small amount of a double silicate of calcium and aluminum is present, which accounts for the resistance of these cements to sea water. The hardening of cements is chiefly due to the hydrating of the calcium silicate, and to a lesser degree to the hydrating of the calcium aluminate.

IN a recent English patent Weil and Levy claim to electroplate aluminum in baths to which various organic substances are added. Thus for the deposition of silver, hydroquinol is added to an ammoniacal cyanid solution; for copper, ammonium gallate or pyrogallate is used; for nickel, milk sugar, and the same for gold.

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CURRENT NOTES ON METEOROLOGY.

CLIMATE AND HYGIENE OF THE CONGO FREE STATE.

AN important volume on the climate, soil and hygiene of the Congo Free State has been issued as the second part of the Proceedings of the *Congrès National d'Hygiène et de Climatologie Médicale de la Belgique et du Congo*, held in Brussels, August 9–14, 1897. The investigation, of which the results are embodied in this report, was undertaken by a commission of the *Société royale de Médicine publique et de Topographie médicale de Belgique*. On this commission meteorology was represented by M. Lancaster, Director of the Meteorological Service of Belgium, which is equivalent to saying that whatever concerns meteorology and climatology in this report is admirably done. As a whole, this volume gives us the most complete and most scientific account of the meteorology and medical climatology of this interesting district that has yet appeared. The first chapter, of 404 pages, is devoted to the meteorology, and presents a careful summary of what is known concerning the atmospheric conditions and phenomena of the region, including many tables and diagrams. This portion of Africa is one of great interest to meteorologists on account of the seasonal migration of the belt of equatorial rains, and the data concerning the rainfall at Vivi and other stations are, therefore, especially welcome. Chapter II., of twenty pages, is devoted to the geology and soil conditions. Over 400 pages are concerned with the medical climatology and hygiene of the region in general and of the different stations in particular. This last chapter is an extremely valuable one. Of especial interest at the present time is the evidence afforded (p. 464–5) by the result of European colonization in the Congo Free State

that, contrary to the general rule, northern Europeans have succeeded there better than southern Europeans. Italian laborers on the railroad are reported as having suffered more from the climate than many Scandinavians employed on the river. It must be remembered, however, that, of the two occupations, railroad construction and steamboat service, the latter is usually far more healthy, especially in a tropical climate, and a higher disease and death rate are naturally to be expected among persons engaged in the former occupation.

A NEW MOUNTAIN ANEROID BAROMETER.

WHYMPER, in the London *Times* of December 17, 1898, describes a new mountain aneroid which gives results of astonishing accuracy. The ordinary aneroid is well known as being a very inaccurate instrument at high altitudes. In Appendix C ('Comparisons of the Aneroid against the Mercurial Barometer'), in his 'Travels amongst the Great Andes of the Equator,' Whymper himself says that "with aneroids of the present construction it is unlikely that decent approximations to the truth will be obtained at low pressures, even when employing a large number of instruments." The errors in Whymper's whole series of observations amounted in the worst cases to as much as two inches, as compared with the mercurial barometer. The new barometer is the invention of Col. H. Watkin, C.B., Chief Inspector of Position-Finding in the (British) War Department. It is so constructed that it can be thrown out of action when not in use, and put in action when required. When out of action no variations in atmospheric pressure, however large, produce any effect on it. This adjustment is effected by having the lower portion of the vacuum box so arranged that it can rise, instead of having it fixed, as is usually the case. A screw arrangement is attached to the lower portion of the vacuum chamber, and under ordinary conditions this screw is released and the chamber put out of strain. When a reading is to be made, the screw is turned as far as it will go, thus bringing the instrument into the normal condition in which it was graduated. Whymper has made a large number of readings with the new aneroid and finds the error, in the mean of 65 observations, below ± 0.0 in. He feels confident that, "in the hand of those who will give the requisite attention, extraordinary results may be obtained from Watkin's Mountain Aneroid in observations made for altitude and in determining differences of level." The instrument is made by J. J. Hicks, 8 Hatton Garden, London.

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ZOOLOGICAL NOTES.

THE NEW YORK ZOOLOGICAL PARK.

BULLETIN 3 of the New York Zoological Society bears testimony to the rapid progress that has been made since July 1, 1898, as may be seen by the following statement of work completed up to December 1, 1898. The Elk House has been practically finished. The Bird House is ready to receive its roof. The foundation walls of the Reptile House have been completed, and the steel floor-beams put in place. All excavating for the first series of Bear Dens has been completed, also all plumbing for drainage and water-supply. The brick walls of the bathing-pools have been built, and stone walls to carry the iron work. The excavation of ponds for the Ducks' Aviary and the construction of three islands have been completed. On the south island twelve enclosures have been laid out, with suitable shelter-houses, and about one hundred native shrubs have been planted. A stone wall, going down to bed rock, has been constructed around the Prairie Dogs' Knoll (eighty feet in diameter), and capped with cut stone. Excavations have been made for the walls and stone work of eight Wolf and Fox Dens, and the walls have been laid ready for the cage work. One sleeping den for wolves has been constructed. About five hundred cubic yards of sandy earth has been hauled to the Pheasant's Aviary, to make dry ground for the runways. This was removed by necessity from the Bear Dens, at no cost to the Aviary. The excavation for the Beaver Pond has been completed, and all the grading necessary thereto. The excavation necessary for the Buffalo House has been made. A trench nine hundred and sixty-three feet in length, has been dug for the stone walls to