first and last conditions of the system. The intermediate states do not affect it. For example: $C+O_2=CO_2$ gives 47 calories. Or, $C+O=CO$ gives 34·5; and then, $CO+O=CO_2$ gives 12·5, and $34·5+12·5=47$ as before. We have not space to notice the five "consequences" from this principle. 3. Third principle. Every chemical change effected without the intervention of any external energy leads to the production of a body, or system of bodies, which give off more heat. For example: $Sn+O=SnO$ gives off in formation 36·9 Cal.; $Sn+O^2=SnO_2$ gives 72·7. Some compounds cannot be formed by their own energy – *e.g.* acetylene is formed by the union of C and H, but it requires the energy of an electric current to induce it.—M. Laurent describes a new saccharometer.—M. Mascart contributes an article on the annealing of glass, having special reference to the preparation of objectives.—M. Blavier's paper, continued from No. 28, is concluded.—M. Marcy describes a new chronograph of a small size convenient for holding in the hand, based on the principle of Duhamel's.—There is also an article by M. Thurot on Galileo's experiments on weight.

Annali di Chimica applicata alla Medicina, No. 2, vol. lix., August.—The present number begins with a paper in pharmacy On the reactions of morphine, from researches by Hermann, Kelbrunser, Siebold, and Schneider.—In dietetics, Prof. Fr. Selmi contributes a paper entitled "New Study of Milk," and there is also one by Dr. Martin on *koumiss*, a vinous liquid obtained by the fermentation of milk.—In toxicology there is a paper by Pietro Albertoni and Filippo Lussana on the physiological criterion for medico-legal proofs of poisoning.—In physiology, Prof. G. See furnishes a paper on the action of the salts of potassium.—Under "Varieties" there are the following papers:—On the culture of *Eucalyptus globulus*, by Dr. Ledeganck.—The blue colour of linen used for medical purposes, by Louquet.—Use of chloroform and ether for stupefying bees, by Chairon.—Phenol-camphorated oil for the gummy disease of fruits, by Dr. F. F. Adorni.—Bisulphite of soda as an antichlore for bleaching, by Dr. T. Schuchardt.—The part concludes with a biological notice of Justus Liebig, by G. Ruspini, and a review of the fourth part of the *Annuaris delle Scienze Mediche*, published by Drs. P. Schivardi and G. Pini.

SOCIETIES AND ACADEMIES

PHILADELPHIA

Academy of Natural Sciences, April 7.—Dr. Jos. Leidy in the chair.—"The Blue Gravel of California," by E. Goldsmith. Under the name of "Blue Gravel" the California gold miners, and especially the placer miners, understand a rock which underlies the gold-bearing alluvium of that State and part of Nevada. It is stated that whenever the gold-bearing sand in many localities in the two above-named States has been removed by the well-known washing process, the "blue gravel" appears. It also contains gold, which cannot, however, be extracted by washing, the stream of water being unable to disintegrate the rock, which is a compact composite one, and not, as the name "gravel" would imply, a loose material. This so-called "blue gravel" is composed of two ingredients widely differing in age, namely, of pebbles cemented together by a lava. The pebbles are of all sizes. From the general appearance I infer that some of these pebbles were derived from the sedimentary rock, slate, and others from hornblende rock. Entirely different in general aspect from the rounded pebbles is the other part of the rock, which I have already stated to be a lava. This appears to envelop the pebbles completely. This lava is very brittle, so much so that the preparation of a thin plate for microscopical observation is impossible. The hardness is equal to apatite. The most distinguishing crystallisation within the lava mass is a black mica, which is probably biotite. I noticed also a few grains of quartz, as well as flattened grains of bright yellow gold. The conclusion at which I arrive is that the so-called "blue gravel" of California is a conglomerate of pebbles of various kinds cemented together by an acidic lava in which crystals of mica (biotite) and grains of gold are imbedded. How the gold came into the lava is a question of some difficulty. Whether it was mingled with the pebbles before the lava ran over the bed, or whether the gold was ejected from the volcano, I am not able to decide.

April 14.—Dr. Ruschenberger, president, in the chair.—Prof. Leidy called attention to the "Bulletin of the United States Geological and Geographical Survey of the Territories, No. 2," presented this evening. It contains a "Review of the Vertebrata of the Cretaceous Period found west of the Mississippi River," by Prof. Cope. In this article he was quoted in such a way as not fairly to express his original meaning. Thus, on one page reference is made to the proceedings of this Academy, in which it is intimated that *Thespesius occidentalis* was referred to the Mammalia, and regarded, perhaps, as a Dinosaurian. "In the Proceedings I have rather expressed the reverse, as I state of *T. occidentalis*, among the collection of vertebrate remains, are two apparent caudal vertebræ and a first phalanx of some huge animal, which I suspect to be a Dinosaurian, though they may have belonged to a mammalian. I may add that Prof. Cope, quoting from the same Proceedings, indicated that I had referred Ischyrotherium to a Sirenian. This is so, but Prof. Cope appears to have overlooked the more full account of the animal in the Trans. of the Am. Phil. Soc., in which, though I still refer it with doubt to the mammalia sirenia, I state that the remains may have belonged to an aquatic reptile."

May 12.—Dr. Ruschenberger, president, in the chair.—Prof. Leidy gave a notice of some new freshwater Rhizopods, having all the essential characters of Amœba, but, in addition, provided with tufts of tail-like appendages or rays, from which he proposed to name the genus Ouramœba. It is possible that Ouramœba is the same as the Plagiophrys of Claparede, though the description of this does not apply to that.—Dr. Chapman made the following remarks on the generative apparatus of the *Tebennophorus carolinensis*:—He found both ova and spermatozoa in the organ regarded first as simply the ovary, later as the testicle.

May 19.—Dr. Kenderdine in the chair.—"The Veins of Beech and Hornbean Leaves." Mr. Thomas Meehan said that De Candolle had noticed some years since a difference in the venation between the *Fagus ferruginea* and *Fagus sylvatica*, the common American and European beeches. In the American beech the lateral veins were said to terminate in the apex of the serratures, in the European they terminate at the base of the sinus. As the statement stood, it conveyed the idea that there was a marked difference in structure between these two allied species, which did not, however, exist, as growing in this country the leaves of the European beech are almost entire; the lateral veins, in approaching the margin of the leaves, curve upwards, and connect with the lateral above them, forming a sort of marginal vein near the outer edge of the leaf. The veins of the American beech curve upward in the same way, but are easily arrested, and this sudden cessation of growth produces the serra, which are slightly curved upwards.—"Direct Growth Force." Mr. Meehan referred to some potatoes exhibited by him to the Academy a few years ago, in which the stolons of a grass had penetrated through from one side to the other, preferring, as it would seem, to go through such an obstruction to turning aside to avoid it. A potato was a rather rough-surfaced body. He now exhibited a similar case, only the obstruction was the round smooth root of an herbaceous peony. Though not more than one-third of an inch thick and round, a stolon of *Triticum repens*, the common couch grass, had pushed itself through.

May 26.—Dr. Ruschenberger, president, in the chair.—On report of the committee to which it had been referred, the following paper was ordered to be published:—"Description of two new fossil shells of the Upper Amazon," by T. A. Conrad.

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