Correspondence.

The Copyright Act Amendment.

To the Editor of the Scientific American:

Permit me to offer a suggestion in reference to your construction of the Amendatory Copyright Act approved August 1, 1882.

Judging simply from the act and collateral legislation, and without having had the advantages of Mr. Clarke in hearing the pro and con arguments before the Patent Committee, I believe that Congress did not contemplate to depart from the interpretation of the words "engraving, cut, and print," embodied in section 3 of the "Act Relating to Patents, Trade Marks, and Copyrights," approved June 18, 1874 (18 Statutes at Large, p. 78), and that the true understanding of the act at issue is, to place emphasis on the words "subject to copyright." Although some of the articles mentioned may be protected under the act of 1874, yet it is obvious that there may be "designs for moulded decorative articles, tiles, plaques, or articles of pottery or metal *subject to copyright*," that is, whose sole purpose is use in the fine arts.

The discriminating power lodged with the Librarian of Congress under the act of 1874 is neither abridged nor altered, and designs for articles of manufacture not within the purview of the Copyright Act are to be treated under the jurisdiction of the Commissioner of Patents.

J. H. ADRIAANS.

Washington, D. C., November 15, 1882.

How to Take Portraits of Burglars.

To the Editor of the Scientific American:

We have evidently entered the age of electricity; and I offer the suggestion of a detective trap for burglars as among the important possibilities.

The burglar alarm now in use, true to its name, alarms the burglar, and he is away.

Instead of ringing the alarm, let it be set to turn on momentarily the full glare of the electric light, and at the same instant have it expose a plate in a camera all ready to take an instantaneous picture. The burglar of course will take to flight, but will leave his photograph behind. The same blaze of light which has alarmed him will awaken the sleeping inmates, who can proceed at once to the camera and secure the negative. In order, however, that the camera should be set at the right focus the alarm used should be an electric mat set in a certain place on the floor, that spot being covered by the focus of the camera.

In case of banks and safety deposit companies, the electric mats should be in front of the iron safes.

E. S. BROWN.

Rutherford, N. J.

Milk and Oil in Disease.

To the Editor of the Scientific American:

I notice in your paper of the 14th of October an article taken from the statements of Dr. Benj. Clark and Dr. Alexander Yale in favor of the use of milk as a diet in dysentery and typhoid fever. They give no dates as to when they commenced to use it. I am now in my seventy-fifth year, and have witnessed several epidemics of dysentery, typhoid, scarlet, and relapsing fevers, smallpox, measles, etc., and have used milk in every case coming under my care for near forty years, in every stage of the disease. I will not say it is a cure, for I do not believe in the so-called "cures" and "specifics." Milk is the natural food of all mammalians. It not only sustains life, but promotes the growth of every part of the system. No other article contains all those ingredients. It is the recuperative power of nature that performs the cure; and he who studies how to assist it by sustaining the system is the best physician, and milk is one of the best agents that can be used. In dysentery I prefer fresh buttermilk, and all the patient wants is perfect rest, and discard all irritating cathartics and purgatives. Mercury in any of its preparations is poison in dysentery or scarlet fever, and the physician who gives them will never be very successful. If his patient recovers it will be despite his treatment. I will add that in smallpox and scarlet fever I anoint the patient from head to feet with olive oil by means of a badger brush, and repeat as often as it disappears, thereby allaying the heat, keeping open the pores of the skin, producing quietude, preventing congestion of the capillary circulation, and obviating the necessity of anodynes. I have practiced the greasing for thirty-five years, and was sneered at by my medical brethren for it and the milk treatment. Now, I believe, it is in general use with the best results.

W. W. TOWNSEND, M.D.

Philadelphia, Pa., November, 1882.

The Coming Transit of Venus.

BY PROF. C. A. YOUNG.

The planet Venus, which all the summer has been conspicuous in the evening sky, reached her greatest distance from the sun upon the 26th of September, and, returning upon her course, is now fast approaching the sun again. On the 6th of December she will pass across the southern portion of the solar disk as a small, black spot, easily visible to the naked eye. The transit, as it is called, will begin in the neighborhood of Boston at about nine o'clock, and will end at about half-past three.

The interest of the event lies not very much in the phenomena presented, but mainly in the fact that transits of Venus are exceedingly rare, and that until recently they were supposed to furnish the most accurate data for determining the distance of the sun. The only transits thus far observed occurred in 1639, in 1761, and 1769, and a few years ago, in 1874. The two next transits, after that of next December, will not take place until the years 2005 and 2013.

It is obvious, of course, that when Venus is between the earth and sun she will look like a black dot upon the sun, and, moreover, that observers at different stations on the earth will see this dot in slightly different positions on the disk. Now, without going into details or explanations as to the why and how, it is enough for our present purpose to say that if observers at widely separated stations of known geographical position will furnish accurate data which determine the precise places on the solar disk occupied by the planet at some definite instant, then we can also compute easily the parallax and distance of the sun. But—and here is trouble—if the data are not extremely accurate, our final result will be widely incorrect. Its value all turns upon the degree of accuracy attainable in the observations.

The observational data may be of three kinds: they may consist of observations of the precise moment at which the disk of the planet touches the disk of the sun—"contacts," technically so called; or of measurements, made during the transit (with a heliometer), of the distance between the planet and the sun's disk; or, finally, of photographic pictures taken at known instants. These pictures are "measured up" afterward, and show autographically, so to speak, where the planet was each moment.

When Halley, about 1680, secured the attention of astronomers to the value of these transits, he supposed, and so did every one, that the moment of contact could be observed with an error not to exceed a second or two. Were this so, the observations of a single transit, by a reasonable number of observers, ought to have settled the parallax of the sun within one one-thousandth of its value, and determined its distance within 100,000 miles.

In fact, however, it appears that from the whole body of contact observations made in 1761 and 1769, more than a hundred in number, nothing further can be certainly concluded than that the sun's parallax lies somewhere between 8·6″ and 8·9″; its distance between ninety-five and ninety-two millions of miles. It was hoped that a century of improvement in telescopes would have made this sort of observation more accurate by this time. But the gain, though real, has been comparatively small. From the contact observations of the English parties in 1874 the most eminent calculators deduce results ranging from 8·76″ to 8·88″, and the difference means a million and a quarter miles in the sun's distance.

The discrepancies are due to slight differences of interpretation put by the computers upon the language used by the observers in describing what they saw; the question being which one precisely of the different phases of the phenomena was really that of the true contact.

The atmosphere of the planet, the so-called "diffraction," and the optical imperfections of the telescope and eye, all conspire to produce uncertainty. The writer himself observed the transit of 1874, and most vividly remembers how gradual, elusive, and perplexing were the phenomena, which endured for at least a minute at each internal contact, and made it quite impossible to fix upon any single second as the true one. While this is true, however, it may perhaps still be possible for practiced observers, with similar telescopes, to come to some reasonably close agreement as to the instants of certain phases in the slow progress of the event.

The method of heliometric measures was employed by the German parties in 1874; but no results of their work have yet been published, so that it is hitherto impossible to compare its accuracy with that of the other methods.

Photography was pretty thoroughly tried at the last transit by nearly all the parties, and in several different ways. The English and Germans used telescopes mounted in the ordinary way, while the French and Americans used long stationary horizontal telescopes, and directed the light through the lens by means of a mirror. So far as can be judged at present, however, these photographic operations were mostly unsuccessful. The pictures were not found to permit of sufficiently accurate measurement to be of any use, and the commission of European astronomers which sat in Paris last spring to discuss the observation of the coming transit did not recommend any further use of photography.

The American photographs, however, turned out better, as did those taken by one of the Russian parties (at Port Possiet); indeed, to say the least, their results seem to be quite as much to be depended on as those of the contact observations. In this state of the case the American astronomers have felt that, all things considered, the photographic apparatus which was prepared for the transit of 1874 should be used again, and a fresh and most careful attempt should be made to "run the thing for all it is worth," as a college boy would say. Near the close of the last session of Congress an appropriation of $75,000 was accordingly made for the transit, and eight parties are to be put into the field—four in the Southern hemisphere, and four in the United States. Professor Newcomb's party goes to the Cape of Good Hope; Professor Boss to Santiago, Chili; Lieutenant Very to Santa Cruz, Patagonia; and Assistant Smith, of the Coast and Geodetic Survey, to New Zealand. In the United States, Assistant Davidson will observe at Fort Thorn, New Mexico; and the Naval Observatory professors (Hall, Harkness, and Eastman) will observe respectively at San Antonio, (Texas), Washington, and Cedar Keys (Florida).

The different observatories throughout the country will also co-operate as far as their means will allow. Princeton will photograph the transit with an apparatus precisely similar to that of the Government parties, and perhaps Harvard may do the same. Yale will use her new heliometer (the only one in the country) to make observations on the German plan. All possessors of telescopes will of course observe the contacts, and on the day of the transit Washington time will be telegraphed to every observer who desires it. A few foreign parties will observe in the United States, especially two German parties—one at Aiken, S. C., the other at Hartford, Conn. For the most part, however, the European astronomers go to the Southern hemisphere, leaving "America for the Americans."

It is not to be disguised that at present it looks as if more accurate determinations of the solar parallax are to be got by other means than by transit observations; as if this old method would prove to be inferior to newer ones, and must finally be superseded. At the same time, this is not quite certain yet; and although some of the leading astronomers have been rather disposed to give the event the "go by," still the prevailing sentiment has been overwhelmingly in favor of making all that is possible out of an opportunity which will not recur for more than a hundred years.—*Boston Journal of Chemistry.*

Action of Hydrated Oxide of Copper on Sugars.

A German with the suggestive name of Hönig (Honey) has been studying sugars in connection with Habermann, and their results are published in a Vienna journal.

Hydrated oxide of copper was prepared by Boettger's method, and in its perfectly pure state was found to be far more permanent than the ordinary hydrate. It would keep for months under water in closed bottles without suffering any change.

The experiments were performed by putting an aqueous solution of the sugar in a flask with a return cooler, the hydrated oxide of copper added, and then gently boiled; after each reduction of the oxide a fresh quantity was added, and so on until the reduction was much slower, which required unequal times for different sugars.

Cane Sugar.—Ordinary white rock candy of the stores was employed in this experiment. A perceptible reduction of the hydrate did not begin until the boiling had continued several hours and there began to be an evolution of carbonic acid. The reduction, which went on rathar largely at first, was much more rapid after the addition of a second and third portion of hydrates. The evolution of carbonic acid became more lively and then subsequently slackened considerably. There is no doubt that in the early part of the process the cane sugar was inverted, when the rest of the process can be readily understood from what follows. The concentration of the sugar solution seemed to exert no special influence on the whole operation.

Invert Sugar.—White rock candy was dissolved in water and inverted by boiling with about two per cent of sulphuric acid. In some cases the sulphuric acid was removed and then hydrated oxide of copper added, and in other cases the latter was added without previously precipitating the acid. The reduction of the hydrate began a short time after the liquid began to boil, and was completed much sooner in an alkaline than in a neutral solution.

Grape Sugar.—The sugar used was a pure preparation made by the Schwarz-Neubauer process. In neutral solutions the reduction was quite slow to begin and went on slowly. Here, too, an evolution of carbonic acid began simultaneously with the reduction. But in solutions to which caustic baryta and potassic hydrate had been added, the reduction began as soon as the hydrated oxide of copper was introduced into the warm solution, and it also proceeded much more rapidly.

Fruit Sugar.—This was prepared from inulin by the well-known method. In neutral solutions the reduction of the copper compound began much sooner than in dextrose solution; scarcely any further increase of activity was noticeable in the alkaline solutions of fruit sugar. In alkaline solution it began at the ordinary temperature with considerable rapidity and ran on to completion.

Boettger's method, referred to above, consists in adding ammonia to a boiling solution of copper sulphate until the precipitate begins to turn blue; this granular crystalline basic salt is then treated with moderately dilute potash or soda. It forms a beautiful sky blue hydrate, easy to wash and dry, and keeps a long time even when moist.

Tea and Coffee Extracts.

An aqueous extract of tea, coffee, cocoa, or ginger, is made by boiling it for fifteen minutes in water containing sulphate of lime in solution, then cooling to 60°, when a solution of tannic acid, previously boiled till nearly devoid of smell, is added. A precipitate occurs and is filtered out. It is then left to stand for a day, and an aqueous gelatine solution of three or four grains to the ounce of water is added in quantity nearly sufficient to precipitate all the tannic acid. The liquor still containing a little tannic acid is strained and bottled.

"PRESENT evidence," says Prof. Owen, in *Longman's Magazine*, "concurs in concluding that the modes of life and grades of thought of the men who have left evidences of their existence at the earliest periods, hitherto discovered and determined, were such as are now observable in 'savages,' or the human races which are commonly so called."