Correspondence.

The Arizona Camels.

To the Editor of the Scientific American:

In the SCIENTIFIC AMERICAN dated March 17, 1894, you copy an article from the San Francisco *Chronicle*, "Wild Camels in Arizona," giving a history of their introduction into that country. These camels, or part of them, are without doubt descendants of a lot that were imported by the United States government just before the civil war, and were used to forward supplies from this city to the different forts then scattered throughout Western Texas. When Texas seceded from the Union all government stores in this city were confiscated or appropriated by the Confederacy, and among them were about fifty camels, which were made to do duty as transports between this city and Forts Dancan and Clark. The superintendent in 1862 of this camel train was W. D. Marshall, who is now living in this city, and with whom the writer is personally acquainted. After the war, these camels were again taken possession of by the United States government, and for a year or more were herded at Camp Verde, about sixty miles northwest of this city, but were not serviceable, as the rocks were too severe on the feet of the camels, and did not prove a success, for the purpose for which they were imported.

The writer's father then lived a few miles from Camp Verde, and often heard him, in after years, speak of these camels, and that the government afterward sent them out to Arizona, and even there, not proving serviceable, were turned loose to shift for themselves. While I do not doubt the correctness of the article copied from the *Chronicle*, some of the herd now roaming in the wilds of Arizona are evidently the increase of the herd sent there after the war from Texas by the United States government. E. S.

San Antonio, Texas, March 21, 1894.

Wool Dyeing: its Principles and Practice.

The various processes employed in dyeing wool are based upon certain principles, upon the observance of which depends in great part the result. These principles are frequently disregarded, and in consequence the result of the dyeing operation is unsatisfactory. It is evident that all the methods of dyeing wool, silk, cotton, or any other fiber must be in conformity both with the properties of the fiber to be dyed and with those of the dye stuffs. Wool is treated differently from cotton, and a dyeing method giving good results upon cotton would, when employed for wool or silk, give either bad or mediocre results; and *vice versa*, a method excellent for wool or silk cannot be used for cotton, owing to the different characteristics of the fiber. Wool has the property of resisting to a high degree the influence of acids, so that it can without injury be treated with strong acids. On the other hand, it is very sensitive to alkalies and alkaline solutions, which affect it to a high degree. Caustic alkalies quickly dissolve wool, and therefore must not be employed in wool dyeing. The carbonates do not have quite so corroding an action on wool, and can be used to a limited degree—that is, in medium strong solutions. Soap has no decomposing effect upon wool, for which reason soap solutions can be used for cleaning and dyeing. In like manner ammonia has no effect, and can therefore be used in place of soap solutions. One characteristic of wool is worth mentioning here, and that is its inclination to felt. When boiled in water and well worked through in this bath, its fibers interlace and form a firmly cohering mass. This tendency must be counteracted as much as possible in cleaning as well as in dyeing wool. It depends much upon the temperature and condition of the bath in which the wool is treated. Too high a temperature and too long a treatment in the bath increase the danger of felting. For this reason a prolonged treatment during boiling must be avoided.

Again, the condition of the bath exerts some influence in this respect. It has been observed that an alkaline bath materially increases the possibility of felting, so that the use of caustic or carbonate alkalies must be avoided. Strong solutions of soap also readily affect felting, and must be either used in limited quantity only or be dispensed with entirely. Ammonia has not so strong a felting effect as the other alkalies.

Acids, on the contrary, prevent the felting; and this is of importance in wool dyeing, because the acid condition of the dye bath is for this staple one of the principal requirements. Alkali salts—for instance, Glauber's salt and table salt—have little or no influence upon the felting, and may be added to the dye bath. Indeed, in many instances they are of advantage in improving the quality of the color. These remarks about wool apply to all other animal fibers, horse hair, rabbit hair, etc., although each kind has a special property of its own as regards its power of resistance to acids and alkalies.

Another point of importance in the dyeing of wool is the varying properties of the dye stuffs employed. It is plain that dye stuffs such as fuchsine or saffranine, for instance, which possess a great affinity for the fiber, must be employed in a different manner from those which do not possess a direct affinity, such as alizarin and gambine, and, again, from those requiring a mordant before they can be used for dyeing. The successful production of the color to be dyed depends upon the minute observance of all these varying conditions.—*Textile Manufacturer.*

Hairy People of Ainu, Japan.

Fresh and important information on the Ainu, the strange, hairy people who inhabit the island of Yezo, in the Japan empire, is given in the modest volume lately published by John Murray. It is written by A. H. Savage Landor, a grandson of the poet, and a clever artist. He traveled all over the island, and lived among the Ainu for five months. He has illustrated his book with drawings of utensils, houses and landscapes, and with portraits of the people. He believes that the pure Ainu do not number more than 8,000, though the population, including half-breeds, is estimated by the Japanese to be from 15,000 to 17,000.

Mr. Landor made his observations in a scientific manner, taking measurements of both men and women. He found the average height of ten pure Ainu, five men and five women, to be 62½ inches for the men and 58⅜ inches for the women; with the arms outstretched, the men measured 65⅜ inches from finger tip to finger tip, the women 61¼ inches.

He makes quite clear the total dissimilarity between the Ainu and the Mongolian. The eye is Caucasian in its form and setting; the iris is light brown or gray. The complexion is a light reddish brown; the hair is generally black and curly in adults, though in one section of the island men were noticed who had hair and beard of reddish color.

He thus describes the typical face: "When seen full face the forehead is narrow and sharply sloped backward, the cheek bones are prominent, and the nose is hooked, slightly flattened, and broad, with wide, strong nostrils. The mouth is generally large, with thick, firm lips, and the under lip well developed. The space from the nose to the mouth is extremely long, while the chin, which is rather round, is comparatively short and not very prominent. Thus the face has the shape of a short oval. The profile is concave, and the mouth and eyebrows are prominent. . . . . In the supraorbital region the central boss is extremely well marked; also the brow ridges, which, however, are slightly less conspicuous than the central boss. The ears are usually large, flat, and simply developed."

The sense of hearing is extremely acute, as is also that of smell. They know a Japanese from an Englishman by his odor, and yet they do not seem to notice the foul odors of their own persons and dwellings, where filth and vermin prevail.

The Ainu women do the hard work and the men are fond of hunting and riding on their ponies. They always pull a heavy object toward them, rather than push it from them, and they use teeth, feet, and toes to help the fingers, preferring to pull with the teeth rather than the hands, when a load is heavy. In all these movements they are like the anthropoid apes. They show little evidence of emotion. Mr. Landor once made a man "roar" with surprise and pleasure; but he never saw one laugh. They seem to have neither sense of shame nor of fear.

On the whole, Mr. Landor's observations lead him to believe that the Ainu are the most primitive of the northern Asiatic races, and that they may have originated from the same stock as did the northern Europeans.

The Application of Chemistry to Tanning.

BY PROF. SADTLER.

One of the industries in which great changes have been made in the last few years, owing to the introduction of new chemical processes, is the tanning and leather industry. While the tanning of heavy leather has been improved by the widespread introduction of oak and hemlock bark extracts of definite and uniform composition, it is in the tanning of lighter leathers, such as calf and kid, that the greatest advances have been made. For these, the "dongola" tanning and the newer "chrome" or mineral tanning processes have almost entirely displaced older methods. The dongola process is a combination process using gambier, alum, and salt, together, in the same liquor, and following the tanning proper by a treatment of the leather with "fat liquor," or oil emulsified with borax or soda solution.

It is, however, the successful introduction of the mineral tanning processes which is now revolutionizing the manufacture of lighter leathers in America. The process generally in use at present involves treating the skins at first with a weak solution of bichromate of potash, to which sufficient hydrochloric acid is added to liberate the chromic acid. After the skins have taken up a bright yellow color through their entire texture, they are drained and transferred to a bath of hyposulphite of soda, to which some acid is added to liberate sulphurous acid, which reduces the chromic acid to green chrome oxide, while the sulphurous acid is at the same time oxidized to sulphuric acid, which liberates a further portion of sulphurous acid until the whole of the chromic acid is reduced. The leather so produced is of a pale bluish-green color, tough and flexible, and thoroughly resistent to water. Indeed, it is this latter property which distinguishes it from all other forms of leather, as the combination of the hide fiber or coriin with the chromium oxide is apparently more stable than its combination with tannin, and yields less to boiling water. The leather also can be dyed and produced in a variety of colors, but the dyeing must be done before the leather dries, as its water-repellent character is such that once dried it cannot be wetted sufficiently to take up a full color. The process is now carried out at several morocco tanneries on a very large scale, and with perfectly satisfactory results.

Chrome tanning processes involving the use of chrome alum and other salts of the sesquioxide of chromium as the basis of the tanning vat have been used, but apparently the combination does not take place so readily as where the chromium oxide is obtained in *statu nascendi* by reduction from the bichromate under the influence of reducing agents. Basic chromium salts have also been recently proposed as mineral tanning agents, but of their practical success I cannot speak from personal knowledge. That mineral tanned leather has taken a strong hold upon the industry was made evident by the many and fine exhibits of such leather at the recent Chicago exhibition.—*Chem. Tr. Jour.*

The First Photographer.

Under this heading W. H. Harrison, in *Photography*, gives the following summary of the career of the first man to introduce the use of the salts of silver into photography.

The first photographer, Johann Heinrich Schulze—sometimes spelled Schultze—was a professor of medicine in the University of Halle, and he wrote a great number of medical works, most of which are in the British Museum Library. He was born at Colbitz in the Duchy of Magdeburg, May 12, 1687. When at school, and before he was ten years of age, Corvinus, the priest of his native hamlet, was struck with his ability; indeed, one day he found him in the garden studying a Greek Testament. His father was a poor tailor at Colbitz. In 1697 young Schulze was sent to the Royal Pædagogium at the University of Halle to continue his education. In 1701 he began the study of Oriental languages, and in 1704 he was admitted into the University of Halle as a student of medicine; he was trained by Professors Stahl, Richter and Eckebrecht; he, at the same time, gave some attention to antiquarian research and to Rabbinic lore. In 1708 he accepted an appointment as teacher in the school of the university, and worked in it for seven years, at the same time carrying on the study of several Eastern dead languages. He then attracted the attention of Frederick Hoffman, the Boerhaave of Germany, who engaged him to aid him in his literary and medical work. He made so much progress that in two years he took the degree of doctor of medicine, and shortly afterward began to obtain public reputation because of his medical writings. After his marriage in 1720 to a relative of Corvinus, he was appointed professor of anatomy at the University of Altdorf. In 1729 he was appointed professor of Greek, and, later on, that of Arabic. The Prussian government, in 1732, appointed him professor of elocution and antiquities at the University of Halle. In 1738 he was nominated a foreign member of the Academy of Sciences, at St. Petersburg, as successor to Bayer, and in 1737 he was professor of theology at Halle. He died October 10, 1744. Schulze was the first to print an image of an object by the agency of light. In 1727 he poured nitrate of silver upon chalk, proved that its darkening in sunlight was due to light and not to heat; then he printed upon the deposit the image of a piece of string tied round the containing glass. This was the first photograph ever taken in the world. Next he pasted printed matter round the glasses containing the deposits, and photographed words and sentences.

American Coal in Mexico.

The successful opening of the harbor at Tampico by the jetty system, and the connection of that port with the interior by the Mexican Central and Mexican Gulf railways, gives an additional outlet for our coal and coke. The growth of the trade is indicated by the exports of coal to Mexico:

Year ending June 30.	Anthracite, tons.	Bituminous, tons.
1890	4,178	84,997
1891	3,683	122,865
1892	3,631	114,979
1893	28,089	158,139

The collapse in silver, with its violent fluctuations, has, of course, disturbed this trade in common with others, so that exports for the seven months of the current fiscal year have been 85,339 tons, as compared with 101,087 tons in 1892–93, those for January being 18,474 tons, against 23,149 tons in that month last year.