

Dark Light.

The claims of M. Gustave Le Bon, a French physicist, to have discovered what he terms "dark light"—an invisible form of radiation arising from the passage of ordinary light through apparently opaque metal plates, and capable of producing shadowgraphs like those of the X rays—have already been noticed in these columns. M. Le Bon's experiments have been described before the French Academy of Sciences, a sufficient proof that they have been performed in good faith; but his conclusions have been usually looked upon with suspicion, men of science having generally thought that he has been deceived by the filtration of light through chinks in his plate holder, or by some similar action. Nevertheless, his experiments and papers continue, and in his last paper, read on May 11, he asserts that many forms of invisible radiation, including Roentgen's X rays, rays from fluorescent bodies, the rays discovered by himself as noted above, and others, are all merely forms of "dark light," which term he thus widens in application to cover all kinds of radiation capable of affecting a photographic plate, but not the retina of the eye. Le Bon's experiments have been unaccountably neglected in this country. They are so simple that it should be easy for almost any one to prove the truth or falsity of his claims, yet no one apparently has thought it worth while to take the trouble. One American scientific magazine of high repute even refers to his experiments as experiments on X rays, says the Literary Digest. It is quite certain, however, that there are forms of invisible radiation capable of taking a photograph, besides the famous X rays. Some of the methods of photographing "in the dark" were known, in fact, long before Roentgen's discovery. It may be that Le Bon has really discovered a new and related form of radiation, and in any case his recent classification of all such forms under one comprehensive head is a step in the right direction. We translate below an extract from the paper alluded to above, together with an abstract of other portions of it, from *Cosmos* (Paris, May 23):

"To place his previous experiments definitely beyond all the objections brought against 'dark light,' notably that which suggests the filtering of ordinary light through the cracks of the plate holder, M. Le Bon has undertaken new experiments with the object of condensing it on the surface of metal plates, and then obliging it to pass through these and act on photographic plates in darkness. We quote from his communication the description of his experiments:

"Take a sheet of copper and one of lead, about one millimeter in thickness; place each of these two sheets in a photographic printing frame instead of the sheet of glass and expose one of the faces—one only—at a distance of 20 centimeters [8 inches] to the light of an electric arc, for one hour. Remove the two frames to darkness and allow them to cool for two hours. Remove the sheets from their frames; then, between the two faces that have not been exposed to the light, place a sensitized glass plate, and the object that we wish to reproduce, a photographic negative for instance, taking care that the object shall be between the copper and the sensitized plate. To avoid all contact action, be careful to separate the sensitized glass from the object to be reproduced, by a sheet of glass or celluloid. It will be sufficient to leave the whole in darkness for five or six hours, to obtain on development a perfect image of the object placed between the metal sheet and the

photographic plate. It is then evident that the light condensed on one of the faces of the sheet of copper has traversed the metal and made an impression on the photographic plate."

"Adopting the term 'dark light' for all forms of invisible radiation hitherto discovered, M. Le Bon believes that he has been able to establish the following classification:

"X Rays.—These traverse black paper and organic substances, do not pass through most metals, and are neither reflected nor refracted.



A HUT IN PROCESS OF CONSTRUCTION.

"Invisible Rays from Fluorescent Bodies.—These pass through metals, as Messrs. D'Arsonval and Becquerel have shown, are refracted and reflected, and present, consequently, no peculiarity permitting us to identify them with the X rays.

"Rays that are Formed when Visible Light Falls on Metallic Surfaces.—The researches of M. Le Bon show that these rays do not pass through black paper, nor through the greater part of organic substances, but that they pass through a large number of metals. They also possess the property of being condensed and diffused, like electricity, on the surface of metals.

"Rays Belonging to Organic Beings.—Rays are emitted by organized beings in darkness, which allow

THE MATABELES AND MASHONAS.

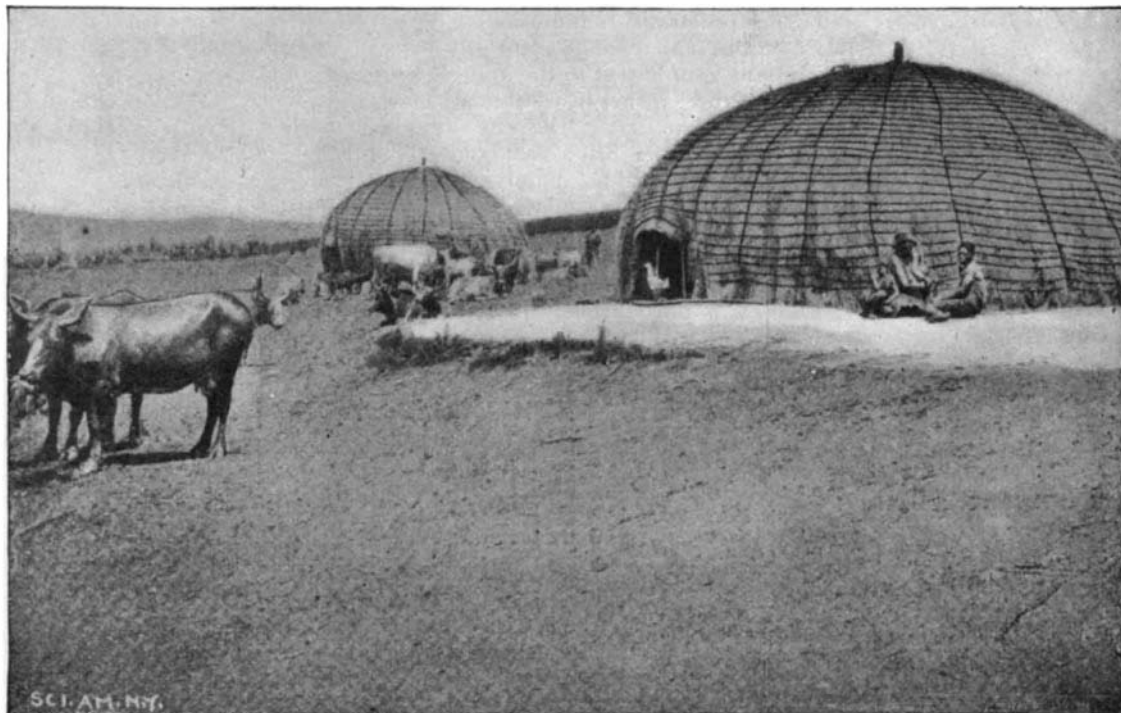
BY P. LEMOSOF, IN MAGASIN PITTORESQUE.

Matabeleland and Mashonaland form part of British Zambezi or Rhodesia, as it has been named from Cecil Rhodes. Various conventions with the neighboring powers have assured to England the possession of this vast country extending northward from Cape Colony, and which a privileged company—the Chartered Company—has tried to render valuable. The results thus far obtained by no means correspond to the amount of money and labor expended in the exploitation of the country; for, although some parts of the territory, in the neighborhood of the rivers—like that in the neighborhood of Senna shown in our engraving—present a real tropical beauty, the greater part of Zambezi is arid and barren, its only riches being a few auriferous veins which scarcely repay the cost of the first installation; and furthermore, it is very difficult to establish trade with the natives, especially with the Matabeles, who are supposed to belong to the most refined tribe of the Kafir races. Imperious, warlike, accustomed to maintain themselves by their raids on neighboring tribes, Matabeleland was, until a few years ago, a very powerful realm. The chiefs of all of these South African tribes, the Mashonas, the Matabeles and the Zulus, enjoy a real authority in spite of their air of indifference and physiognomies which

offer so little that is attractive in the eyes of white men, and for this authority there is fierce contention among the descendants of a deceased chief.

Like the ancient feudal lords, African princes usually obtain supremacy over their people only at the price of the blood of their opponents. The reign of the last monarch of the Matabeles, Lo Benguela, was inaugurated by the massacre of all of his brothers. It is true that he was encouraged in this particularly by his sister Njina, who hoped also to gain power, but having, in her turn, been accused of casting a spell over the queen, rendering her barren, the tender sister was condemned to death and hung from a tree on April 2, 1880. It is thus seen that the

women of these countries play a certain part, in spite of the state of servitude endured by the "weaker" sex among all primitive races. The distribution of work is often quite the reverse of that which we are accustomed to see among civilized people. On the shores of the Zambezi, especially where the breeding and raising of cattle is impossible on account of the ravages of the fly tze-tze, agriculture constitutes the only occupation of the inhabitants. The work of the fields falls entirely upon the women, who start off early in the mornings to cultivate the ground and raise the grain and corn. Millet or sorghum, called mabele by the Matabeles and imphi by the other tribes, constitutes their principal food. The cooking is carefully attended to by the men who remain in

**MATABELE HAMLET.**

From photographs supplied by the Société de Géographie.

us to photograph them, as M. Le Bon has shown by operating on ferns, fishes and various animals. These rays appear to be related to the invisible rays of phosphorescence, but they differ nevertheless in that they do not pass through metallic bodies, at least those experimented upon—notably aluminum."

Como, in Italy, is the birthplace of Alessandro Volta, and will celebrate, in 1899, the hundredth anniversary of his invention of the voltaic battery by an electrical exhibition and congress.

the village, and they also take care of the household arrangements. After the return home the members of the family assemble around the pot, into which each one dips his five fingers and makes a ball, which quickly disappears down his throat. This is the one meal of the day. They talk often until very late at night, all smoking the daga, a kind of native tobacco, after which all go to bed, either inside of the huts or in the open air, rolled in a sheepskin.

Contrary to the practice among other African races, the Matabele women are subjected to a most austere

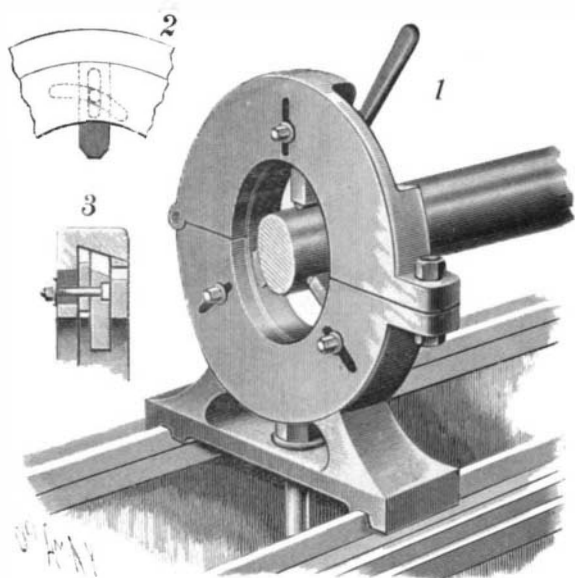
regime, such as is almost unknown among other primitive peoples. Any immorality, especially of young girls, is severely punished, and European travelers have seen young people instantly put to death for such offenses. This severity is much relaxed in regard to their relations with whites, the birth of a halfbreed child giving prestige to the mother.

The dwellings of the Matabeles, as well as those of the Mashonas and other Kafir races of Southern Africa, vary according to the importance of the tribes and the positions of the occupants. Those intended for the masters are generally round, spacious, with an opening serving for a door by which admittance is obtained to the kraal or inclosure reserved for the members of the family. All are made of reeds or bamboo. Some of the tribes give a certain elegance to the construction of their houses, which are square and thatched, recalling the isbas of the Russian peasants. The huts occupied by the servants and slaves are, on the other hand, nothing but miserable kennels, often much dilapidated, and for a door there is only a hole at the base of the hut, which can be entered only by crawling in.

A slow transformation, however, is taking place in the lives of these people, as European civilization penetrates into their country. The "Chartered Company," often derided, has already accomplished considerable work: roads have been made, railroads built and exchanges established where the natives become familiar with European products, the need of which they begin to feel more and more. Who knows but these grown-up children, gay, unconscious, naive rather than perverse, may render a great service to humanity by trying to fertilize the immense tracts which are still uncultivated and which can be transformed into productive land only by the labor of man?

A NEW STEADY REST FOR ENGINE LATHES.

A handy form of steady rest, so arranged as to facilitate the lining up of work in the lathe, has been patented by Mr. John H. Blum, of the Western Iron Works, East Second Street, Butte City, Montana. The stand is made in two halves, which are hinged together, and secured by a bolt at the free ends; the base being adapted to slide longitudinally on the bed of the lathe, and to be secured thereon by a suitable clamp, as shown in the accompanying illustration. The stand is annular in shape and is accurately turned to receive an annular jaw carrier, whose periphery is



BLUM'S STEADY REST FOR ENGINE LATHES.

beveled and rotates snugly in contact with the stand.

In the jaw carrier are a number of radial grooves, in which the jaws that engage the work are fitted to slide freely. Each of the jaws carries a bolt, which extends at right angles to the jaw, and passes through a cam slot formed in a flat ring which is mounted to turn in a circular recess formed on the inner face of the jaw carrier. These bolts also pass through radial slots formed in the back of the stand. The ring is provided with a handle, by the operation of which the bolts and the jaws to which they are attached are caused to travel in the cam slots and are given a radial motion to or from the work in the lathe. By this means the jaws are simultaneously moved in to engage the work, and the jaw bolts having been tightened up, the work so engaged is held in the center of the rest. If it is desired, the jaws can be provided with rollers as shown in the illustration.

Extraordinary Skin Grafting.

Dr. Nicholas Senn has made a success of an extraordinary operation in skin grafting, says the Chicago Times-Herald. Nothing of the kind was ever tried before, and the eminent Chicago surgeon has startled his medical brethren again by his daring, and is receiving their plaudits for the triumph of his remarkable experiment.

The parboiled hand of a man, devoid of skin on its back, was inserted in a puncture made between the skin and flesh of the man's own stomach and fastened



A NATIVE MEAL.



A SOUTH AFRICAN PRINCE.

there for three weeks, literally in a sling of skin and flesh. When it was removed it was found that the skin of the stomach had grown to the back of the hand. It was carefully treated, trimmed down to where it should grow, and a triumph in the surgery of skin grafting was made public.

The patient is E. E. Lyday, cashier of the First National Bank of Newton, Iowa. He has been a resident and business man of that place for years. Mr. Lyday was a victim of a wreck on the Chicago, Rock Island and Pacific Railway at Grinnell, Iowa, in 1894. The hot air pressure on a coach at that time severely scalded his face and hands. He was scarred for life. In the course of time he recovered the use of his left hand, but his right hand was so parboiled and maimed that he lost control of it. The member was like a piece of mangled beef. The skin was hopelessly and permanently gone from finger tip to wrist.

Being possessed of means, Mr. Lyday sought the best of surgical aid regardless of expense, but without avail until recently. Several weeks ago he came to Chicago and went to St. Joseph's Hospital. Dr. Senn was summoned.

The surgeon found that the hand baffled all old remedies at grafting. He finally decided to make an experiment as the last hope for relief. Lyday shuddered at the suggestion, but pluckily agreed to the test. Dr. Senn decided that the chance was to slice a piece of skin in Lyday's breast or stomach so that the hand could be inserted therein between the flesh and skin, thus practically making a sling of skin and flesh, in which the patient could rest his disfigured hand.

Lyday first submitted to the knife April 25. A piece of his skin three inches in width, five inches long and one-quarter of an inch thick was skillfully cut. The unique bandage was lifted to permit the insertion of the mangled and scalded hand which needed a new covering. The hand was placed in this novel grafting device. The triumph was complete. The skin had grown on the back of the hand, and a process was promptly applied to substitute another skin on the stomach and breast from which the strip had been transferred to the hand.

A photographer took advantage of the opportunity, and several good negatives of the achievement were secured. Mr. Lyday is in excellent spirits, and Dr. Senn naturally is proud of the success of his novel experiment.

The Bicycle Among the Savages.

Oscar Tomare, the prince of the island of Bora Bora, one of the largest of the Society Islands, in the South Pacific Ocean, arrived recently in San Francisco from Scotland, where for the last five years he has been taking a course in English. The prince is a tall, dark young man, about twenty five years of age, with a pleasant, affable manner. He was a nephew of the late King Pomare, the last ruler of the island of Tahiti, and a cousin of Queen Mamea, who was recently deposed as the sovereign of the rebellious natives of Raiatea.

When Prince Tomare left his home in the islands five years ago, he could not speak a word of English, but now he converses, not only in the Anglo-Saxon tongue, but in French and German as well. He is an advanced student in political economy, and spent nearly a year in studying art in Paris, where his oil paintings received very high commendation.

"I went to Scotland to be educated," said the prince to a representative of the San Francisco Examiner, "because a great many of the young men of the royal families in the South Sea Islands were educated there,

Arthur Brander and John Brander, both friends of mine, were educated in that country. I was a student at the Edinburgh University. The rules are very strict, and so are the professors, but it is all for the best; you learn a great deal more.

"I have been all through Europe—France, Germany, Great Britain and Greece—but there is no country that shows such a great amount of enterprise as America. New York, I think, is the greatest city in the world, and San Francisco is the prettiest. I am not a stranger, for I stayed here a month when on my way to Scotland.

"I am a confirmed bicyclist and ride whenever I get a chance. I believe I would have ridden out here from New York if the roads had been good. On Monday I am going down town to purchase twelve wheels to take home with me for the members of my household and my family. They will be the first wheels to be introduced in the islands, and I know the natives will be astonished when they see them. It will be funny to see a lot of men and women with nothing on but pareus (native body cloths) riding around on bicycles among the banana trees."

AN AUTOMATIC DUPLICATOR.

The Neostyle Company, of 100 Church Street, New York, for the past ten years manufacturers of neostyle duplicators, have just placed upon the market the automatic neostyle, a machine which, owing to its efficiency and simplicity, and to the admirable work it performs, will be found a convenient adjunct to any office.

With the automatic neostyle an original is written either with the neostyle pen or ordinary typewriter on a sheet of patented stencil paper. The stencil is then laid on the printing platen, and a slight movement of the lever causes the frame to close, then the stencil is automatically held in the printing frame. All that is now necessary to do is to feed the machine and operate the lever. The ink is fed automatically, the supply being regulated by a small thumb screw. Copies can therefore be light or dark, according to the ink that is allowed to flow (a thousand copies can be taken without touching the ink fountain). This ink, as soon as it is deposited on the plate, is taken up automatically by two rollers which distribute it evenly, the ink plate revolving a quarter of a turn at each impression. The movement of the lever brings the printing roller across the stencil, the pressure being regulated automatically, thus insuring an even



AN AUTOMATIC DUPLICATOR.

copy. As soon as copy is taken the movement of the lever is reversed, the frame opens and the sheet is discharged automatically. A simple indicator shows the number of copies printed. The machine can be made ready or closed up in five seconds, without disconnecting a single part.

In the year ending May 10, 1896, photographs of the sun were taken at Greenwich with the Dallmeyer photoheliograph, mounted on the terrace roof of the south wing of the Physical Observatory, on 229 days, and of these, 459 have been selected for preservation, besides 14 photographs with double images of the sun for determination of zero of position angle. For the year 1895, Greenwich photographs have been selected for measurement on 249 days, and photographs from India and Mauritius—filling up the gaps in the series—on 113 days, making a total of 362 days out of 365 on which photographs are available.