to the square inch. Until 1895 such conditions could only be brought about at great expense, and the liquefaction of air and other difficultly liquefiable gases had been conducted on a small scale. In that year a process was invented whereby air could be liquefied at small expense, and in considerable quantities. Ramsay used especial instruments devised for this purpose—using them for the double purpose as a refrigerant for liquefying argon and to see whether the liquid argon itself would not yield up some of the undiscovered element. On distilling the liquid obtained from about four gallons of argon gas, it was discovered that a gas lighter than argon passed over; and on still boiling, gases heavier than argon were distinguished. The spectroscope was again called to aid, and no difficulty experienced in recognizing three new elements: the lightest gas called neon, "the new one;" and of the two heavier ones, one was called krypton, "the hidden one," and the other xenon, "the stranger." The mixture we

air. While this is an unsatisfactory admission with which to conclude my story, let us bear in mind that, after all, we know but little of the secrets of nature, and that future investigations will tend to modify largely the results of the past.

ETHNIC STYLES IN CENTRAL AMERICAN ARCHITECTURE.*

By STEPHEN D. PEET.

THE most interesting point of resemblance between the architecture of the Muskogees and of the Aztecs and Toltecs, is found in the temples or so-called rotundas, or places of assembly. The rotundas of the southern tribes were, to be sure, constructed out of wood and were rude in their appearance, and yet when we come to consider their shape and general style of construction, the symbolism which was em-

in the form of serpents between the earth and sky, while the sun with its changes shone in from the four quarters. The symbolism which is contained in these great houses and rotundas of the southern Indians is certainly very significant, especially considering the fact that they so closely resembled that which prevailed among the so-called civilized people of Mexico and Central America, for it shows that they had contact with one another and may have belonged to the same stock, and originally migrated from the same center. There was, to be sure, as we have said, a variation in the style of building between these tribes, but it was a variation which was more noticeable in the houses of the common people than in the houses of the rulers or in the rotundas. Bartram describes these as being the same among the Cherokees, Choctaws and Chickasaws.

The feature which furnishes the most striking resemblance between the works of the southern Indians

COLUMNS AND HALLS AT XKICHMOOK, YUCATAN.

STAIRWAY AND HALLS, EDIFICE NO. 3, AT XKICHMOOK.

call the atmosphere contains of the five following elements these proportions: 9.37 parts of argon per hundred; 102.2 parts of neon per hundred thousand; one or two parts of helium per million; about one part of krypton per million; and about one part of xenon in twenty millions: it is therefore the rarest element known.

So far as we can see at the present time these five new elements serve no useful purpose. Oxygen keeps everything alive; nitrogen restrains the activity of oxygen; carbon dioxide, ammonia, nitric acid and nitrous acid are necessary to the growth of plants; vapor of water plays a grand part in those important and never-ceasing changes we call the weather; and even ozone contributes its share of usefulness in freeing the atmosphere from deleterious matters; but no apparent benefit to the living world can be instanced as the result of the presence of argon and its associates in the

bodied in their ornaments, carved figures, also the general arrangement of the different parts and the use of them, especially in connection with their religious ceremonies, we shall find many very striking analogies.

These rude and primitive temples, which were called rotundas, with their covering of bark and their circle of seats or sofas on which the inmates lounged, with the fire in the center, were indeed very inferior to the massive stone structures which were wrought with such care and contained so many religious symbols, and yet we may perceive a resemblance between every part, for both represented apparently the great temple of the universe with its circular horizon and the dome of the sky surmounting it, the sacred fire being in the center beneath the dome and the lightnings playing

and those of the Mexican tribes, and at the same time shows the greatest contrast to the earthworks of the northern Indians, is the pyramid.

The pyramidal mounds mark the site of an ancient village of the southern mound builders, a village in which the houses of the chiefs were placed above those of the common people, all of them arranged in a quadrangular form, but with stairways leading from them to the open area in the center, while a long wall stretches away from the group on the side of the stream or bayou, thus furnishing a landing place for the people in time of high water. The truncated pyramids at Teotihuacan, on the other hand, mark the site of an ancient, prehistoric city, which was situated in a great plain. The houses of the ruling classes in this city, however, were arranged as were those of the village. They were all placed on the summit of the pyramids, but in quadrangles, all of them front-

* American Antiquarian.

ing the courts, which were inclosed, while a wide road, called the "Pathway of the Dead," led from the central temple to the gateway in the distance. The contrast between the village of the mound builders and the city of the pyramid builders seems to be great, yet the foundations on which the two widely separated peoples placed their temples and the houses of the ruling classes are very similar.

This resemblance between the works of the southern mound builders and of the pyramid builders of the southwest, can hardly be accounted for on the ground of ethnic relationship, inasmuch as the people at present speak different languages. Still there are traditions among the Muskogees to the effect that their ancestors migrated from the west and southwest, from the mountain of fire, and entered the region of the Gulf States many generations ago. That there was a resemblance in the arrangement of the apartments of

forming the quadrangle, and the division of each into apartments, is shown in the accompanying plan."

The resemblance extends to other things besides the shape, and relative situation of the buildings, for the social organization and customs were quite similar. Bartram says:

"The mounds and cubical yards seem to have been raised in part for ornament and recreation, and likewise to serve some other public purpose, since they were always so situated as to command the most extensive prospect over the town and country adjacent. The tetragon terraces seemed to be the foundation of a fortress, and perhaps the great pyramidal mounds served the purpose of lookout towers and high places for sacrifice. The sunken area was the place where they burnt and tortured the captives, and was surrounded by a bank—sometimes two of them, one behind and above the other—which were used as seats to

or king, was elected by a council, but was regarded with great respect. His appearance is altogether mysterious; as a munificent deity, he rises over them as the sun rises to bless the earth; he is universally acknowledged to be the greatest person among them, and is loved, esteemed and revered. Their Mico seems to them the representative of Providence, or the Great Spirit. He has the power of calling a council to deliberate on peace or war, and presides daily in the councils, either at the rotunda or public square, and decides upon all complaints and differences. He receives the visits of strangers, gives audience to ambassadors, and also disposes of the public granary.

"There is, in every town or tribe, a high priest, who presides in spiritual affairs, and is a person of consequence. He maintains and exercises a great influence in the state, particularly in military affairs. The senate never determines on an expedition against their

STAIRWAY AND RUINED TEMPLE AT XKICHMOOK.

RUINED PALACE OF XKICHMOOK, YUCATAN.

the great house of the Muskogees and the apartments of the palace of the Mayas, may be seen from the cuts, which represent the ground plan of the palace called the Nunnery, at Uxmal, and the restoration of the palace of Palenque. Bancroft has described the Nunnery as follows:

"This is perhaps the most wonderful edifice or collection of edifices in Yucatan, if not the finest specimen of aboriginal sculpture and architecture in America. The supporting mound is, in general terms, 350 feet square and 19 feet high, its sides very nearly facing the cardinal points. The southern or front slope of the mound is about 70 feet wide and rises in three grades or terraces. There are some traces of a wide central stairway, leading up to the second terrace. On the platform stand four of the typical Yucatan edifices, built around a courtyard, with openings between them and the corners. The situation of the four structures

accommodate the spectators at such tragical scenes. The high pyramidal mounds are to be seen with spacious and extensive avenues leading from them to an artificial lake, or pond of water. Obelisks, or pillars of wood, were placed in the center of the areas, about forty feet in height and two or three feet in diameter, gradually tapering in the midst of an oblong square. The pillars and walls of the houses of the square are decorated with various paintings and sculptures, with men in a variety of attitudes, having the head of some kind of an animal, as those of a duck, turkey, bear, fox, wolf or deer; and the pillars in front of the council house were formed in the likeness of serpents."

There was not only a rotunda and a public square, answering to the temple and the palace of the more civilized tribes, but there were also priests and kings, which answered to the ruling classes. "The chief,

enemy without his counsel and assistance. His influence is so great as to turn back an army when within a day's journey of their enemy."

SALTS OF GLUCINIUM.

M. LACOMBE, in a paper read before the Académie des Sciences, describes a number of new salts of glucinium which he has succeeded in preparing. The acetate of glucinium, having the formula $(C_2 H_3 O_2)_2 Gl$, has been already formed by him, and the new series are homologous with the acetate; thus he forms a group including the formiate, acetate, propionate, etc. All these compounds are of the type R, Gl, O , where R represents the radical of the fatty acid. They are formed by the action of an excess of a fatty acid upon carbonate of glucinium. The presence of a trace of water is necessary to provoke the reaction,