

writer observed a great improvement in 1902. Many of the school children could make themselves understood in English, and the men, from more frequent association with the whites, had made sufficient progress in the language to protect to some extent, their rights in trading. In 1904 a still larger number of Zuñis had more or less command of English.

PHYSICAL CHARACTERS^a

As a rule the forms of the Zuñis are symmetrical and their carriage graceful. The women are small, with shapely limbs, hands, and feet. Many are handsome in their youth, but they grow corpulent at an early age. When the laughing eyes of youth become somewhat dimmed by years, they acquire a kind, motherly expression. In 1879 seven albinos were found among the Zuñis. Mr Stevenson with difficulty gathered six of the albinos in a group and secured a photograph of them (see plate XCIX). The mother of an infant albino could not be prevailed upon to allow her child to be photographed. Indeed, these people are so sensitive of their condition that they avoid the presence of strangers, and while the men may stand their ground, the women and children, especially the latter, flee from the "Americano." The writer has seen several of the children grow to girlhood and womanhood. A birth of an albino child occurred in 1896. These people have light, decidedly yellowish hair and complexions of decided delicacy. They all have weak eyes, and their vision is so affected by the absence of choroid pigment that they are obliged to protect their eyes, which always become inflamed from ordinary daylight. When out of doors the albino men wear hats, when they can be secured, and the women cover their faces with blankets and peep through the smallest openings. The statement that albinos are compelled to live apart from the others of the tribe is erroneous, and none of them are debarred from religious or social privileges. In no instance has an albino parent an albino child, and no two of them belong to the same family. The adults are each married to a dark-haired Indian, and they have healthy offspring.

The writer is under obligations to Dr Ales Hrdlicka, curator of physical anthropology in the United States National Museum, who in 1900 visited and examined many of the Zuñis, for the following notes, in the proportions and features of the peoples:

The Zuñis show a considerable variation in stature, but may be described as below medium height. Among 60 adult men, 5 per cent measured 150 to 155 cm. in height; 23.3 per cent, 155 to 160 cm.; 26.7 per cent, 160 to 165 cm.; 31.7 per cent, 165 to 170 cm.; and 13.3 per cent, 170 to 175 cm.

Among 49 men with undeformed heads only 5 had a cephalic index below 77; in 12 it was between 77 and 80, and in 32, or 65 per cent, it was above 80. Thus the tribe may be considered as predominately brachycephalic, with a considerable varia-

^aThe extreme isolation of the Zuñis has preserved a strong individuality.

tion. There are indications that this variation is largely due to an early admixture of a dolichocephalic people.

The face is usually of moderate dimensions, with more or less prominent cheek bones. The average bizygomatic breadth in the men is 14.3 cm.; average height from chin to nasion, 11.5 cm.; average height of forehead from nasion to hair line, 7 cm. The nose is rather short, with an average nasal index of 82. The nasal bridge is mostly moderately convex or concavo-convex. The mouth is rather large; the lips vary from medium to well-developed, in the European standard. Alveolar prognathism is mostly pronounced, but facial prognathism is small. The angles of the lower jaw are often quite prominent in the male.

The body is generally well developed, and shows more uniformity than in whites. In 3 out of the 60 men examined there was a tendency to obesity. In women this is more frequent, but the corpulence very seldom reaches a degree at which it would become uncomfortable. The average chest diameters in men, at nipple height, are: Depth, 21.4 cm.; breadth, 32.9 cm. The limbs show ordinary muscularity. The arm expanse in men exceeds the height on the average by 4.7 cm. The sitting height is, in males, on the average, 52.3 per cent of the stature. The calf is generally smaller than in whites, and the hands and feet are of moderate dimensions.

The physical characteristics of the Zuñis identify this tribe closely with the Hopis and the majority of the other Pueblos. There is also some physical relation to the Navahos, and, farther south, to many of the peoples who spoke the Nahuatlan language.

The several albinos who were examined showed nothing abnormal in their measurements.

MEDICAL PRACTICE

The belief held by some students that the therapeutics of the North American Indians is associated altogether with occultism is erroneous. Though the practice of the Zuñis is to a large extent fetishistic, it is rich in legitimate drugs. Some of these drugs are employed in conjunction with theurgism; but frequently medicines are administered both internally and externally in the most matter-of-fact way without prayers or incantations, not only by the old women, who know various plant medicines, but also by the professional man or woman, who is always a theurgist of some esoteric fraternity.

Some of the Zuñi medicines are administered in accordance with the doctrine of signatures, in conjunction with prayers and other ceremonies. Others are the medicines of the Beast Gods of the six regions, snake medicine, ant medicine, medicine of the feathered kingdom, and *te'nas'sali*, the mythical medicine plant which is said to bear blossoms of the colors of the six regions. While these medicines, which are mainly plants, are used in conjunction with fetishes of the animals to which they belong, they are generally of real medicinal value. Massage is extensively practiced, and the masseur or masseuse is most proficient.

For any complicated or mysterious trouble, or one which does not yield readily to legitimate medicine, some higher power than man must be called upon to eradicate the disease "shot" into the person by witchcraft. In such cases the Beast Gods act through their agents, the

theurgists, who have great influence, the patient and the family showing every confidence in their doctor, who selects some one against whom he harbors animosity as the destroyer of the health of his patient. The patient also, or a member of the family, may accuse some man or woman as the witch who "shot" the medicine into him. The practices of the theurgists are fully described in the section relating to witchcraft and esoteric fraternities.

There can be no doubt of the use of antiseptics among these primitive people antedating the modern practice of surgery. What the scientific man learns through investigation and experiment, aboriginal man discovers by accident and chance experience. The Indian's treatment is blindly empiric. He does not understand why his medicine cures; he simply knows that it does cure, and he attributes the cause to some divine power. He applies the antiseptic without bathing his hands or the parts affected, and the wound is usually covered with a soiled cloth. He does a part, however, and nature completes the work.

Bacteriology teaches that disease is to a large extent the result of microbes; the Zuñi theurgists declare disease generally to be caused by foreign life "shot" into the body by witches. Roentgen learned to illuminate the bones and viscera with X rays; the Zuñi theurgist holds a crystal in the light immediately before his patient that he may see into the flesh and locate the disease. It can not be said whether the Zuñi women ever had a struggle to enter the field of medicine, but to-day some of the most successful practitioners, both in legitimate medicine and in theurgy, are women, though they are much fewer than the men. Some of the male theurgists are successful in certain kinds of surgery, especially in the treatment of fractures and dislocations.

In 1879 the writer discovered that the Zuñis employed a narcotic, but she failed to secure specimens of the drug until 1902, which was then found to be *Datura stramonium*, jimson-weed. The mention of the original discovery caused remark at the time, some ethnologists declaring that though the North American Indians had intoxicants, they were entirely ignorant of narcotics. Mr James Mooney, of the Bureau of American Ethnology, who observed the use of the peyote plant with ceremonial forms among the Kiowas and other tribes of the southern plains southward into Mexico, was the first to bring, in 1891, the plant and ceremony to scientific attention. He supplied the late Dr D. W. Prentiss with a quantity of this plant, and after many careful experiments with it Doctor Prentiss administered it to his patients as an anesthetic with most favorable results. The Zuñis do not know the peyote, but they use the jimson weed, which they call *a'neglakya*, both as a narcotic and externally for wounds and bruises. The blossoms and root ground to a powder are applied externally. This plant is of still further value to the Zuñis, for when

the rain priests go out at night to commune with the feathered kingdom they put a bit of this powdered root into their eyes, ears, and mouth that the birds may not be afraid and will listen to them when they pray to the birds to sing for the rains to come. A small piece of the root is chewed when one wishes to commune with the spirits of the dead that rains may come. The following is the legend associated with this plant: "In the olden time when the A'shiwi were near Ko'thluwala'wa (abiding place of the Council of the Gods) a brother and sister—the boy's name was A'neglakya, and the girl's name was A'neglakya'si'sa—were always walking about the country and looking everywhere and seeing everything, and were always telling their mother what they saw. This was not pleasing to Kōw-wituma and Wats'usi, the Divine Ones, and the two were banished into the earth and they became the plant which bears their name. They have many plant children. Some of the blossoms are all white, others are tinted with blue, while others are edged with yellow, blue, or red."

A'neglakya belongs to all of the rain priests and to the directors of the Little Fire and Cimex fraternities. Only those to whom the plant belongs are privileged to collect it. Four prayer plumes are made by one who is to gather the plants. One offering is to A'neglakya, one to A'neglakya'si'sa, and two to ancestors. The four prayer plumes are planted the depth of the arm in an excavation made with an ancient bean planter at daylight on the morning the plant is to be collected.

The writer observed Nai'uchi, the celebrated theurgist of the Little Fire fraternity, administer the narcotic previous to operating upon a woman's breast. The abscess was cut with a flint lancet, the wound was probed with the index finger and the pus forced out. The patient slept placidly through the operation, which would otherwise have been most painful, and when she awoke there was no evidence that she had been under the influence of a drug.

A'neglakya is sometimes administered by a rain priest when one wishes to recover stolen property. The rain priest is received at night in an inner room in the house of the man who lost his property. He sits alone without fire or light, and the room is dark. The man wears a new white cotton shirt and trousers and new blue knitted leggings. No head-kerchief or moccasins are worn. His hair is done in the usual style. A pallet is spread on the floor. The rain priest sits before the man, and taking a bit of the root of a'neglakya from the palm of his left hand places it in the man's mouth with the words: "I give this medicine to my child that he may become hāli'shoti (intoxicated)^a and see the one who has robbed him." The man then lies on the pallet, and the rain priest retires to a front room and sits by the communicating door, which he closes, and continues to listen attentively during the night. He does not smoke, as A'neglakya does not like

^aThe Zuñis use the same word for insanity.

smoking at this time, and he is all alone. He hears the man walking about at intervals and is careful to catch every word he utters. The name which the man calls during the time he is under the influence of the medicine is that of the thief. At daylight the rain priest returns to the inner room to find the man either lying down or walking about. He wakens the man by grabbing his arm and leads him into the front room, where they sit side by side facing east, and the rain priest relates what he heard during the night and tells the man that the name he called is that of the thief. The man denies all recollection of what passed during the night. He is instructed by the rain priest to call upon the rogue and demand his property. The rain priest then makes a fire and heats water and has the man drink a quantity, which induces vomiting. The dose of warm water is repeated four times with the same results, that all the a'neglakya taken the previous night may be thrown up. The rain priest then leaves the man alone, but returns in a short time with his wife and other female members of the family who prepare yucca suds and wash the man's head, while he kneels on a blanket, and the rain priest sits behind him with a hand on either shoulder. The man's family may be present at this ceremony, but they take no part in it. After the head is washed, the rain priest gives four ears of corn tied together, calico, and other presents, according to his wealth or generosity. The corn is planted the coming season separately from other corn. The women return to their house and bring food which they prepared during the night, which is eaten by all present. After the repast, the loser of the property goes to the house of the person whom he named when intoxicated and demands his property, saying: "I saw you when I was drunk with a'neglakya." If the accused is guilty, he returns the property, for he would be afraid to keep it and thus offend A'neglakya.

For treating a patient outside the ceremonial chamber the Zuñi doctor is paid according to his reputation, but there is no charge when the patient is treated during a meeting of an esoteric fraternity. Like the civilized physician, the Zuñi doctor does not practice in his own family, except in rare instances when the theurgist has great faith in his ability and feels that he can save the life of the dear one.

A case of pneumonia developed on October 20, 1895, and continued six weeks, with severe fever, leaving the man very weak, and with an ugly cough. He was anxious to be placed in the care of the writer, but the jealousy of the officiating theurgist prevented any other treatment than his own. The theurgist, on his arrival, took a seat by the patient and requested that a basket tray be brought to him. He then took the hand of the patient and made inquiries regarding his condition. He removed a cougar fetish and several small bags of medicine from his pouch and deposited them in the basket; then, holding the fetish between his hands, which he carried close to his lips, he made a

long prayer, so low as not to be heard. Laying the fetish in the basket, he took a minute quantity of medicine from two of the bags and deposited it in a bowl of cold water, stirring the water with a hollow reed; then he held the bowl close to the patient, who took six swallows of the medicine through the reed. The blanket covering was then turned down, exposing the chest of the patient. A small quantity of the medicine was again taken from each bag and this was run in four perpendicular lines over the chest and down the lymphatics; then both ears were touched with the medicine. The theurgist did not cease praying while handling the medicine. Continuing to pray for power to restore his patient to health, he took the fetish and medicine bags into his right hand and touched them to the right shoulder, the head, and the left shoulder of the patient. The diet was confined to a small quantity of bread and commercial tea without sugar for the first four days, during which time the Beast Gods of the four regions were appealed to and the fetish medicines were used. After this the patient was permitted to eat as he chose. For the first ten days the pulse was 120; and afterward it was never less than 110 during the six weeks of the fever, and the cough with constant expectoration caused the patient great suffering and almost reduced him to a skeleton.

The body was usually exposed to the waist, as it is not considered well to be covered when the skin is hot. During rainy and cold weather the sick man was often left without fire, especially at night, when the room, which was small, became intensely cold. On November 2 the patient was carried in a blanket through the snow to his mother's house, where he could have a larger and more comfortable room; and the mother had Na'iuchi and others of the Little Fire fraternity called in to use their efforts in curing her son. The ceremony was similar to that held by the Kia'kwemosi and other members of the U'huhukwe fraternity over a smallpox patient.^a The day following the fourth and last night of the ceremonies of the members of the Little Fire fraternity the patient claimed to feel much improved, though the pulse was 105; eight days later the pulse was 90, the cough slightly better. After six weeks of this low condition the patient began to mend, and at the end of the eighth week he was able to be about, but the cough remained when the writer left in January.

A most distressing case of hysteria was witnessed by the writer. A beautiful young girl, about 12 years of age, had suffered for five weeks, the cause being suppression of the menses. Her family attributed the trouble to witchcraft, and no sooner was the girl brought from her mother's farm at Ojo Caliente to Zuñi than a prominent theurgist was summoned, and no time was lost in bringing the accused

^aSee p. 527.

wizard to trial. The tribunal met on the night of the arrival of the child. This trial is fully described in the section on witchcraft. The writer, who was called to the house of the invalid soon after her arrival, endeavored to take the pulse, but found this impossible, though the little sufferer, who was rational and deeply attached to the writer, made every effort to keep the emaciated arm quiet. She rolled and tossed, pulled at her hair and throat, and threw her arms wildly about, her legs moving as violently as her arms. Her head was never quiet for a moment. The loving family took turns in gently holding her on the pallet. First the mother, then the father at intervals appealed to the writer to help their poor child. After many efforts the writer succeeded in taking the pulse of the girl on the third evening after her return to Zuñi, and found it to be 110. It was still necessary for her to be held on the bed. She slept but little, and the liquid nourishment prepared by the writer was given to her from the mouth of her mother in small quantities until the eleventh day, when there was a slight change for the better. The pulse was now 90, but on the twelfth day it rose to 100. On the night of that day the writer found the patient eating cold boiled potatoes, and on the following day she was indulged with unripe watermelon, which she seemed to enjoy greatly. The menses appeared on the thirteenth day, and the pulse was reduced to 80. The patient continued gradually to improve until her health was fully restored. The writer could not discover that any other than fetishistic medicines were administered to this girl.

Once, while the writer was deep in the mysteries of theurgism with Na'iuchi, an elderly woman hurried into the room and with streaming eyes and trembling voice urged the great theurgist to come to the bedside of her dying grandchild. Not a moment was to be lost if the life of this wee one, so precious to the parents and grandparents, was to be saved. The writer accompanied Na'iuchi, who closely followed the grandmother, and they found the infant, who was 18 months old, lying on a pallet in a comatose condition. The fond mother, half reclining by its side, looked the picture of despair. With tears rolling down her face she greeted the doctor and implored him to save the life of her child. Na'iuchi at once began his work. Taking his seat at the left of the child, he manipulated the entire body in the most heroic manner, giving special attention to the stomach and abdomen. The infant was not exposed to the air, as is usually the case during such treatment, Na'iuchi seeming to understand that the body must be kept warm with the blanket covering. In a few seconds after he began his treatment a faint wail from the child was heard, and later the groans from the little one were distressing to listen to; yet the mother

sat by without saying one word to the theurgist,^a and there was not even an expression of concern on his face for the pain he was inflicting upon the child. No medicine was used in this case, which appeared to the writer, on entering the room, to be an entirely hopeless one. Within an hour the patient was restored to its normal condition of health, and on the following morning the writer observed the infant on the back of its mother eating green watermelon, which seems not to have induced a return of cholera infantum.

In another case treated by Na'iuchi the child, though very low, was not in a comatose state. He remained but a short time with the little one, manipulating it as described above, and then left, saying: "I must go now to my fraternity, but will soon return." After an hour he went to his home, and securing medicine, made another visit to the infant. He mixed the medicine, which was an emetic, with warm water and administered a small quantity at a time by dipping a reed into the water and putting it to the child's mouth. After doing thus several times, Na'iuchi again left, giving instructions to the mother about repeating the dose. About two hours after the doctor departed, the infant, after copious vomiting, was found much improved and enjoying nourishment from the mother's breast.

Massage is the treatment for rheumatism, and sheep chips heated before the fire and sprinkled with water, which are used for any trouble that may be relieved by steady heat, are applied externally, one cake of the manure being kept by the fire while another is in use.

In 1896 the writer became interested in a child of 9 years afflicted with curvature of the spine. This child fell from a ladder when she was 5 years old, injuring her back, and she had been growing worse since the accident. She had a beautiful face and was so patient and gentle that she won the heart of the writer, and the two became fast friends. At this time there was no appearance of abscess. In 1902 the writer returned to Zuñi and found her little friend, who was then 15, suffering from a large lumbar abscess with probable caries of the vertebrae. The girl's face, though still beautiful, bore evidence of great suffering. She was colorless and emaciated, but with it all a most patient little sufferer. Her sad face and ever gentle bearing were profoundly touching. An incision had been made for the purpose of drainage, beginning in the lumbar region about 1½ inches above the crest of the pelvis at the outer side of the spinal column and running diagonally downward and forward to the inner side of the anterior superior spine of the ilium and continuing forward along the groin for nearly its entire extent. The wound was packed with a mix-

^aThe writer has never known a member of a family to interfere in the slightest degree with the treatment of the theurgist. It may be here stated that no precaution whatever is taken to prevent cholera infantum among the Zuñi children. As soon as an infant is able to hold anything in its hand the probability is that it will be sucking or biting on something not less harmful, perhaps, than a piece of unripe watermelon.

ture of piñon gum, kernels of squash seeds, and mutton grease, and a cotton bandage of many thicknesses was wrapped around the body. The writer, wishing to render such relief as was possible, called upon Doctor Wood, of the Indian Service, who had been sent from the Indian school at Albuquerque to treat diphtheria.^a

After a short call upon the child the doctor left her to visit the diphtheria patients while the writer attended to having the wound cleansed for his inspection. The work assigned her was not an easy task. The parents of the child, who were in great distress over her suffering, were ready to obey instructions, but other members of the family feared to give offense to the doctor who was treating her. Their opposition was finally overcome by the suggestion that the Zuñi and American doctors meet and discuss the case. The father of the invalid at once hastened for the medicine man, who, on his arrival, made positive objection to any interference on the part of the American doctor. His scruples were overcome, however, and he placed the little sufferer over his knee, face downward. A doctress who was present heated water, and the process of cleansing the wound began. After applying the crushed kernels of squash seeds moistened in the mouth to soften the piñon gum, the doctor inserted his forefinger into the wound and drew out the gum. Some time was required to remove all of the packing, and a heart of stone would have been touched at the sound of the feeble moans and cries of the child. It seemed as if she must succumb to the supreme agony. Doctor Wood on his return found that the wound had been thoroughly freed of the gum and bathed with warm water and soap. He knew that the patient was beyond even temporary improvement and that all he could hope to do was to make the remaining hours as comfortable as possible. He sprinkled the wound with boracic acid and wrapped it with aseptic gauze. After a time a faint smile brightened the face of the sufferer as she whispered to the writer: "I feel as if I had never been sick, the pain is so little now." And so this little soldier, who had endured so much, lay in comparative comfort and peace for two days, when she fell into her everlasting sleep, leaving her "Washington mother" to tell of her beauty of person and soul.

Another interesting case of primitive surgery was that of a Hopi Indian who had been married many years to a Zuñi woman. He fell from a wagon and broke his left jaw. The inferior maxillary bone was removed, leaving a fistular opening in the cheek opposite the lobe of the ear, the rim of the opening having completely cicatrized when

^aDoctor Wood's use of antitoxin soon brought the diphtheria under control. Too much cannot be said in praise of Miss Palen, the field matron, for her untiring work in carrying out the doctor's instructions. As the medicine man must be liberally compensated for his services, many of the Zuñis are glad to save the expense of the doctor's fee in cases of slight troubles by going to Miss Palen, in whom they have great confidence; at least this is the case with the more progressive Indians. Miss Palen pretenses to know but little about therapeutics, but her heart is in her work, and the Indians would hate to part with her.

seen by the writer. The man in conversation or when eating pressed his hand against the opening.

The writer has observed one case of dislocated kneecap for which splints and bandages were used—that of a child 6 years of age. In plate c a mother and two children are shown. The elder child with the right leg in splints is the one suffering from dislocated kneecap.

The Ne'wekwe (Galaxy) fraternity are famous for curing the bite of the rattlesnake. A man suffering from a wound must remain alone in a room, for should he chance to see a woman nourishing her infant he would surely die. A combination of three roots is chewed by the medicine man and applied to the wound. The patient also chews the roots. It is believed that if clouds gather after one is bitten, he is more likely to die, for then the snakes go about vigorously and the limbs swell to the heart; but if the sun shines hot, the snakes are lazy, and in four days the one bitten will be well.

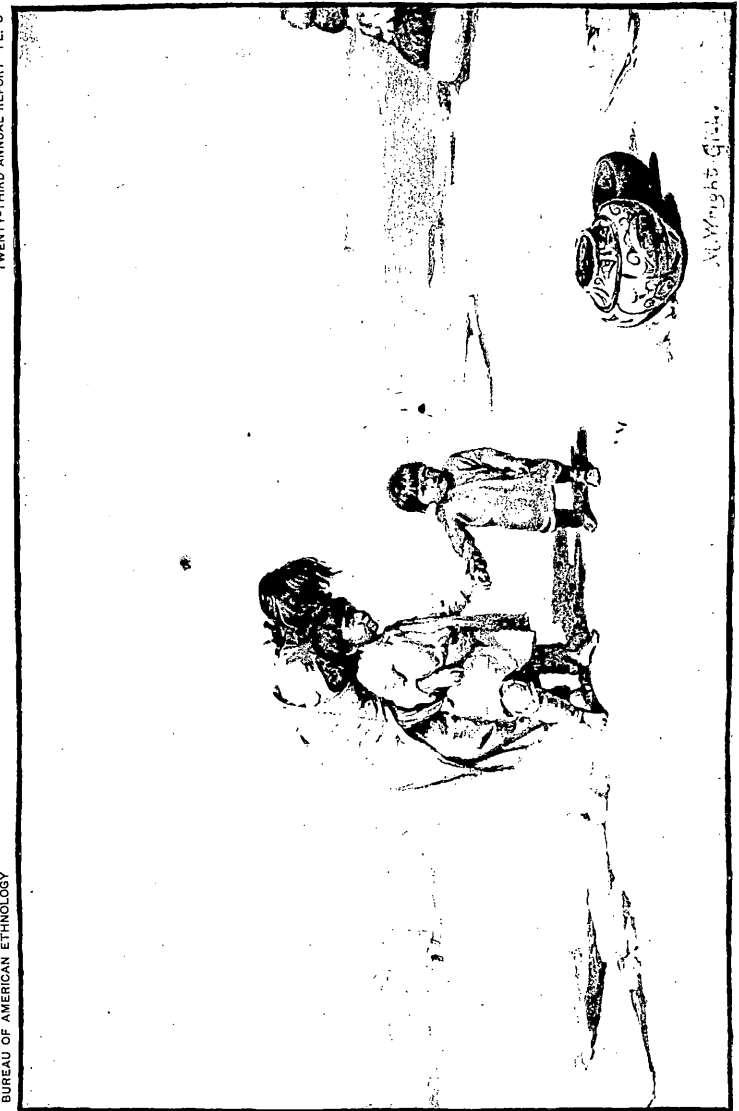
WITCHCRAFT

Belief in witchcraft seems to be universal among the Indian tribes, and no great advance in civilization can be made among them until the beliefs and the accompanying practices are rooted out. It can not be hoped that this will be accomplished at once, at least if strangers to the religion and social customs of the people undertake the task. When it is remembered how recently reputed witches were put to death among our own people, and how persistently the negroes and the more ignorant whites still cling to the belief, what can be expected from peoples in that stage of culture where superstition is the prime factor in their lives?

Primitive man is less happy in his philosophy than enlightened man, because the latter has left behind many of his superstitions. The primitive man's world abounds in perplexing mysteries. All that his untutored mind fails to comprehend is associated with some occult power. This is the condition in which we find the North American Indians. These people are in constant terror of being conjured. Young mothers especially are solicitous for their infants, since these are the targets for the venom of diabolical beings. The child's head and face are always covered when a supposed witch approaches. Again, no man or woman who is reduced to poverty or has some physical deformity, especially any peculiarity that might be taken for the evil eye, or has made an enemy of a prominent member of the tribe, feels safe from accusation. The owner of fine beads and other adornments experiences much bitter with the sweet of possession because of the fear that some witch, prompted by jealousy, will strike him with disease. Moonlight is a great boon to those who must go about at night, for it enables them to identify suspicious objects. They say

TWENTY-THIRD ANNUAL REPORT PL. C

BUREAU OF AMERICAN ETHNOLOGY



At Wright Gish.

CHILD WITH BROKEN LEG IN SPLINTS