

## TRACHOMA AMONG THE INDIANS OF THE SOUTHWEST\*

WILLIAM CAMPBELL POSEY, M.D.

PHILADELPHIA

Two years ago the Secretary of the Interior, Dr. Hubert Work, requested the American Medical Association to appoint a committee of ophthalmologists from the Association with whom he might confer as occasion demanded on the spread of trachoma among the Indians.

The trustees accordingly appointed Drs. Wilder of Chicago, Knapp of New York and me to serve on such a committee, Dr. Proctor of Boston being added to our number later on account of his familiarity with the Indian problem in the Southwest.

Last summer Dr. Wilder, the chairman of the committee, with Dr. Holloway of Philadelphia and others, visited some of the reservations in Oklahoma, and last autumn, in order to be in a better position to advise the secretary by making a personal survey and study of the situation at close range, Dr. Proctor and I visited the Southwest and inspected the most important Indian schools and hospitals in that region. We found trachoma among the Indians everywhere, children as well as adults exhibiting all stages of the disease, which differed in no way from the manifestations observed elsewhere. The youngest subject we saw was a 3 months old child, with numerous characteristic granules studding the conjunctiva of both upper and lower lids.

Some years ago the government made the education of Indian children obligatory and, when attendance at some nearby day school was impossible, enforced the rule requiring residence in one of its boarding schools. There are many such throughout the Indian territory; we visited only three—that at Albuquerque, N. M., Fort Defiance, Ariz., and Riverside, Calif. The Albuquerque school accommodates 830 boys and girls, the one at Fort Defiance is somewhat smaller, while the school at Riverside has almost 1,000 pupils. All three of these institutions are housed in large buildings provided with spacious playgrounds. The dormitories are roomy and airy, and each pupil has a separate bed on which the linen is clean. The children wash under running water and dry their hands and faces on small individual towels. The pupils appear well nourished, active and happy. Many had trachoma, and from our investigations it was apparent that, notwithstanding the sanitation of the schools, the disease is propagated there and that some pupils who enter in the autumn with unaffected eyes return to their homes in the summer with trachoma.

In attendance at each of these schools is a resident physician of the Indian Service who is more or less familiar with diseases of the eye, but with insufficient time and inadequate nursing at his command to give proper care in the trachoma cases under his supervision. No doubt owing to the increased knowledge of the disease acquired as a consequence of the campaign which the government has been carrying on against trachoma in recent years, we found all the physicians of the Indian Service with whom we came in contact able to recognize and properly treat the disease. No cases of mistaken diagnosis were observed; none of follicular or vernal conjunctivitis mistaken for the more serious affection of the conjunctiva.

Connected with each of the schools is a small hospital where sick children are cared for. In recent years the government has detailed three officers of the Indian Medical Corps to travel over the Southwest and treat trachoma cases only, and has established a small trachoma hospital in Albuquerque. It is doubtful how much good is accomplished by this "clean-up" kind of treatment, most of the cases so handled being children who demand more than one application of a surgeon's knife or scarifier before they can be pronounced cured. The comparatively few adults treated, most of whom have distorted cartilages, are in all probability benefited.

As is well recognized, trachoma is common among the adult members of the various tribes; 25 per cent, or perhaps more, of the Navajo and Pueblo tribes are said to have the disease, mostly in its cicatricial stages, though we observed all other types.

Among the villages we visited were Santa Clara, near Santa Fe, famous for its black pottery; Laguna, with its well conducted, though small, hospital and sanatorium for tuberculous subjects, and the far famed sky city of Acoma. We investigated the conditions of living in these localities and found them to be very conducive to the spread of disease. The majority live in hogans, or cabins, which are badly ventilated and do not offer hygienic facilities. Many members of the tribes are shepherds and when caring for their flocks are exposed to the extremes of cold and heat in winter and summer, and to the irritating dust of the desert, and have scant facilities for bathing or cleanliness. These tribesmen live as close to nature as is possible in a beautiful but ill favored region to support human life. I am speaking particularly of the 35,000 or more members of the Navajo tribe in whose reservation we spent most of our time.

On our return to Washington we conferred with the authorities and, in our advisory capacity, recommended to the Secretary of the Interior that trachomatous children in the schools be separated from those unaffected by the disease, and that their eyes be given continuous treatment until they can be pronounced cured and no longer capable of infecting the eyes of others.

We suggested that this might be best accomplished by the creation of hospital schools, somewhat after the plan of those in operation in London which were founded by the school boards there about twenty-five years ago.

To save expense we suggested that the department might convert one of the existing schools into such an institution, children with involved eyes taking the place of those free from the disease, who should be removed to other schools. Children with the disease should be detained in such an institution for years under constant medical supervision and treatment, receiving such education and manual training as their ocular condition permits. Children not having the disease will thus be able to pursue their studies without danger of infection from their schoolmates.

It is my opinion that the compulsory education program for children, admirable and necessary as it is, has been the chief cause of the increase of trachoma among the Indians in recent years. It has been the bringing together in close contact in the schools of children with the disease who under the old system of tribal life led a more or less isolated existence and consequently were less likely to give the disease to others.

The extermination of trachoma among the adult Indians, particularly those of the nomadic tribes, presents a very difficult problem. Added to the conditions

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of life, which are all unfavorable, is the problem of the "medicine man" and the religion of the Indians; the "medicine man" being regarded by them as not only a physical healer but a spiritual priest as well. If the Indian rejects his advice and spurns his medicine, he is endangering the future of his "spirit" and subjects himself to the opprobrium of his tribe.

It is hard to realize how exceedingly primitive many of these older Indians are in manner of living, and that few speak other than the Indian language. It will need the impress derived from the education of several generations of children before the adult Indian will be ready to receive and adopt the standards of living of the white citizens who surround him. In the meantime much can be done to supplement the training which their children are receiving by educational efforts directed to the adults themselves. This is difficult when dealing with nomadic tribes unfamiliar with our language, and can best be done, I am told, by the establishment of community centers, similar to those the government has already instituted in some places at trading posts and schools, which inviting conditions may beguile the older Indians to visit and there receive instruction through the medium of moving pictures and talks in their own language about better modes of life. Indian girls who have been trained as nurses, or other graduates of the schools who may show an aptitude for such service and who may impart to their elders some of the knowledge they have acquired in the schools, should be chosen.

More efficacious than traveling ophthalmologists and so-called clean-up campaigns would be the establishment of a number of hospitals for the treatment of eye diseases. These should be easy of access and should have ample provision for indoor treatment. There is a lack of hospital facilities in the Indian Service not only for treating diseases of the eye but also for general medical and surgical work. A first-class general hospital with modern laboratory and roentgen-ray equipment is badly needed in the Indian Service of the Southwest.

The cooperation of state health officers and of all organizations interested in the welfare of the Indian will be necessary to win the adult Indian to more hygienic ways of life. Incidentally, as the Indian rises to the white man's level in this respect, the government and all other agencies interested in Indian welfare will need to exercise increased vigilance to protect the neophyte from some of the evils of white companionship. "Fire water" is still as deleterious to the Indian as ever, and I am told that nearly all the arrests which are made in Indian reservations are for crimes instigated by drinking. The day will come, however, when the Indians, so far as manner of living is concerned, will be indistinguishable from the white people. Not until then, in my opinion, will trachoma cease to trouble them, for trachoma is a disease that flourishes only under adverse conditions of living; remove these and the spread of the disease will soon be controlled.

A final word as to local treatment. With one exception, all the physicians of the Indian Service with whom we came in contact are following a conservative plan of treatment, conserving the conjunctiva in the early stages, avoiding the mutilation of the mucous membrane, as advocated by Abadie and Darier, and getting rid of the trachomatous elements by expression and mild grattage, followed by applications of silver and copper. In the later stages when contracted cartilages irritate and cilia become inverted, tarsectomy is practiced. We saw some evil results of tarsectomy, such as retracted lids and undue scarring of the conjunctiva, and we heard of one case in which loss of both eyes

followed the operation, no doubt from infection, the result of improper care during the operation or later.

Our committee is much gratified to learn of the recent establishment by the government of a trachoma hospital school at Fort Defiance, Ariz. This we believe is the most important step the government has thus far taken toward eradicating the disease. Should this school prove successful, others will without doubt follow throughout the Indian region. The government should receive the hearty commendation of the profession on the step it has taken, for there were obstacles in the way—natural prejudice on the part of Indian parents on being separated from their children, and other technical difficulties known only to the department. Dr. Richards, the medical officer in the Indian Service who will have charge of the school, has been long in the service and is thoroughly conversant with trachoma; he is conservative, an able administrator, and has the confidence of every one. There has long been a boarding school for Indians at Fort Defiance, on the site of the old fort which gave its name to the place, located some thirty miles north of Gallup, in Arizona, close to the New Mexico line. The spacious buildings are admirably situated at the foot of a beautiful canyon. Avenues of cottonwoods, set out by a provident early superintendent, give shade in a region otherwise bereft of trees. The present superintendent is able and popular, the whole institution being conducted in a manner that augurs well for the success of this very important undertaking.

## THE ROSE BENGAL TEST FOR LIVER FUNCTION\*

### FURTHER STUDIES

N. N. EPSTEIN, M.D.; G. D. DELPRAT, M.D.

AND

WILLIAM J. KERR, M.D.

SAN FRANCISCO

The value of rose bengal as a clinical test for the estimation of liver activity has been proved conclusively by preliminary experiments and observations.<sup>1</sup> Our purpose in this paper is to describe a simplification of the technic of the test, and to review briefly the types of liver injury which may be revealed by a test of this kind.

As has been described in our previous communications, rose bengal is a dye (di-iodo-tetra-chlor-fluorescein) of the triphenylmethane series, which is readily soluble in water or saline solution, and which is not toxic for the tissues of the human body. Although Norman and Schmidt<sup>2</sup> have shown that under the influence of direct sunlight the dye very readily hemolyzes red blood cells in vitro, this photodynamic effect does not seem to occur within the human body to an

\* From the Departments of Medicine and Dermatology, University of California Medical School.

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