

# COLOR BLINDNESS IN ASIATICS.

BY F. B. STEPHENSON, SURGEON U. S. N.

The following are observations made during 1891-1892-1893.

## I.

In Unalaska, one of the Aleutian islands, about a thousand miles west of Sitka, the inhabitants are chiefly Aleuts, with Aleuto-Russian creoles. Their faces, especially the expression of eyes, strongly resemble Japanese features.

Examined by Holmgren's color tests: one male, aged seven years; thirty females, aged from four to nineteen years. Color perception and visual power were good in all.

The natives speak Aleut, Russian, English.

The following vocabulary was taken from the lips of a girl about ten years of age:

Chidló	green	Prizidnika	apron (probably from Russian)
Orloth	red	Aidyúnga	fog
Olah	house	Ikálmakhta	graveyard
Allaugh	sea	Aidyáoga	mother (possibly from Japanese)
Grikle	grass	Táta	father (possibly from Japanese)
Hak	fish	Taiyáho	men (possibly from Japanese)
Tangue	water	Chichágo	baby (possibly from Japanese)
Chikamulauch	hut (house of the natives) (in Russian barabar)	Mikháu	play
Akhódyak	sun	Asihn lau	many people
Tooghídah	moon	Portrait toksan	took pictures (probably foreign word.)
Akatélkerin	do not know	(suggests Japanese)	
Miláyutalik	to go (in a boat)		
Atakhau	one	Shíchín	four
(possibly Japanese origin)		(perhaps from Japanese)	
Alihh	two	Chauh	five.

## II. HAWAIIAN ISLANDS.

### HONOLULU.

Sept. 28-30, 1891.

Examined for color-blindness (red and green) natives (kanaka), with Holmgren's tests:

Men of Queen's Guard	... ..	30 persons
Boys (school) aged 6-18...	... ..	65 persons
Girls (school) aged 4-14...	... ..	96 persons

Color perception and visual power were normal.

### III. JAPAN.

Tokyo, Nov. 9, 1891.

By kindness of Surgeon General T. Ishiguro and Surgeon Hori of the Army I have been allowed access to official reports, from which the following is taken:

Men of the Army	1200 persons examined in
1883,	19 or 1.583% red blind.
	10 or 0.833% green blind.

Holmgren's tests were used.

### YOKOHAMA.

January-March 1892.

The following results were obtained by examination of the pupils in the public schools, with Holmgren's tests:

Boys aged	7 years,	49...eyes normal
" "	8-9 "	110...2 weak color sense
" "	9-10 "	53...1 red blind
" "	10-12 "	61...1 red blind
" "	13 "	100...2 red blind
Total.....		<u>373</u>

Percentage.....	I.+
Girls, aged 7 years	47...eyes normal
"    " 8—9 "	55... " "
"    " 9—10 "	47...(1) one green blind
"    " 10—11 "	55...2 weak color sense: confused blue and purple
"    " 12—13 "	66...1 weak color sense: confused blue and purple.
Total.....	<u>270</u>

Percentage.....0.4+  
 Total number here examined .....643  
 Percentage.....0.8+

Some pupils of both sexes selected more shades than others, doing so more rapidly, without hesitation.

During 1890-92 pupils of both sexes, from six to thirteen years of age were examined as to visual power. Of 887 (eight hundred eighty seven) 46 (forty-six) or 5.4 percent, were myopic.

These figures (as to myopia) were taken from public school reports.

KYOTO.

The following data were sent me by courtesy of Prof. John C. Berry, M. D., of Dōshisha Hospital, Kyōto, Helmgren's tests were used:

Of 596 men examined for color blindness, 5.45 per cent showed defective color sense.

Of 1410 men examined, 33.2 per cent were found myopic. 0.2 percent were found hypermetropic.

IV. CHINA.

Fuchau (Nautai),  
 (Foochow) 1892.

At the hospital and schools were examined, by Holmgren's tests:

45 males, 31 females. Color sense normal; several of both sexes showed tendency to mix blue and green.

Amoy, 1893.

At schools and hospitals were examined, with Holmgren's tests:

112 males, 140 females. One boy was found to be redblind and myopic. The others were normal.

Both sexes showed a tendency to mix green and blue.

Chifu (Cheefoo) 1892.

At the school of Rev. Dr. Barbett were examined, by Holmgren's tests:

50 men and youths. All were normal, although two showed hesitation between blue and purple.

Shanghai, 1892.

At the Eye Hospital were examined, with Holmgren's tests:

47 males, 6 females. All normal.

At Sicawei, in the French Orphan Asylum and schools, were examined, with Holmgren's tests:

50 males, 26 females, several of which latter showed tendency to mix green and blue. The others were normal.

At St. Luke's Hospital were examined, by Holmgren's tests:

25 males, 25 females. All were normal.

The surgeon in charge, Dr. Boone, informed me, that some years ago, he had examined several hundred Chinese and found the average defect in color blindness about the same as shown in examination of the peoples inhabiting Europe and America.

At St. John's College (Jesofield) were examined by Holmgren's tests:

85 males, 49 females. All were normal.

Total number examined at Shanghai:

207 males, 106 females

H. G. Palgrave, in "Eastern and Central Arabic" (1862-3) states that the inhabitants of Djebel Shomer showed a tendency to mingle green, brown, etc. Perhaps red blindness existed.

On page 272, he writes: "The colors green, black, and brown are habitually confounded in common Arabic parlance; though the difference between them is, of course, well known, and maintained in lexicons, or wherever accuracy of speech is aimed at."

V. COCHIN-CHINA (ANNAM).

Saigon, 1893.

Examined, by Holmgren's tests, in the An-

namite cities near this French capital—in hospitals and asylums of Choquan, Cholon, and Uytho, were:

96 males, 117 females. All were normal.

#### VI. SIAM.

Bangkok, 1893.

Examined, by Holmgren's tests, in schools:

45 males; 35 females. One bright lad was completely red blind. The others were normal. Many of both sexes showed a tendency to mix blue and green, which colors are often designated by the same word—as is the case in China and Japan.

#### VII. STRAITS SETTLEMENTS.

1893. Singapore.

Examined by Holmgren's tests, in schools:

366 males of Malay race and language.

One boy was red blind. All others normal. 30 females of Malay race and tongue. All normal color sense.

32 males, 89 females of Eurasian origin: having a mingled parentage of Malay with English, German, French, Portuguese. Color sense normal.

55 males of Tamil race (origin: Madras and vicinity). 2 red blind, otherwise color sense normal.

1 male of Dyak (Borneo) family, color sense normal.

2 males, Japanese, . . . . . color sense normal.

97 males, Chinese, . . . . . color sense normal.

Malacca.

Examined by Holmgren's tests, in schools:

56 males, Chinese: Color sense normal.

11 males, Malays: Color sense normal.

Penang.

Examined by Holmgren's tests, in schools:

99 males, Malays: Color sense normal.

In all 1059 Chinese were examined. One boy was red blind and myopic. Percentage 0.09.

Of 506 Malays examined, one boy was red blind. Percentage, 0.19.

#### VIII. KOREA. 1892.

Séoul,

At the American Mission Hospital 50 persons of different sexes and ages were examined: all normal.

Chemulpho. (Ninsen)

The surgeon at the English mission said that it would be useless to try to induce the people to pick out the colors. Not seeing the use or need of such examination they refuse compliance, are suspicious, fearing the evil influences of spirits terrestrial, infernal, supernal—the great unknown, so widely used to enslave mankind.

Dr. Landis also informed me that he had observed several instances of myctalopia, (vision being more distinct in a dim light or semi-darkness).

Finally these results are considered together, inasmuch as all these people may be regarded as cognate in origin:

Total number examined . . . 4860.

Deficient in color perception . . . 37.

Percentage . . . . . 0.76.

These are meager data, but such as were to be had under the circumstances. May some one do better!

I here insert a paper by a physician, long resident in China.

(From "The China Medical Missionary

Journal,"—June 1890, vol. IV. p. 61.)

#### COLOR SENSE AND COLOR BLINDNESS AMONG CHINESE.

Based on an examination of twelve hundred persons.

BY ADELE M. FIELDE, SWATOW, CHINA.

A love of vivid colors is manifested in all branches of Chinese decorative art. The walls of public buildings are commonly adorned with paintings—historical, dramatic or conventional. Porcelain dishes, paper scrolls and gauze fans are made to glow with tints that are at once delicate and brilliant. The shoes of all bound-footed women and the costumes of all actors are covered with variegated embroidery. Countless hues are shown in the silken fabrics which are

made into galaday dress for both men and women. Children, on festive occasions, are always gorgeously attired. No one thinks it amiss to put on a cap of scarlet, a tunic of buff, trousers of green and shoes of pink. Whether in garb, or in pictures, there is nothing in Chinese taste that forbids the juxtaposition of purple and green, of rose and orange, or of any other known tints. Like nature herself, they boldly array themselves in all colors, and the experienced eye is no more offended by their tegument than by that of a mandarin duck or a macaw.

A few colors—black, white, red, yellow, light blue, dark blue, bright green, dull green and fleshcolor—have each a name of one independent syllable, while their shades are indicated by prefixed adjectives. Many other colors are designated by reference to familiar objects, as “peach-blossom” for pink, “pigs liver” for brown; “coir-palm” for russet; “ashes” for drab; and “grapes” for purple. Dye-stuffs furnish terms for several colors, and “ink water” thus used, becomes a comprehensible appellation for pale gray; but it is not easy to see why the effects of logwood dyeing should be termed “celestial green,” when manifested in satin, though “red night” has a poetic sound for the same shade in cotton goods.

The fact that the cloudless sky is always called green by the Chinese, and their lack of precision generally in regard to colors, led me long ago to consider them deficient in color-sense.

As I could find no account of their ever having been scientifically tested for this defect, I read last year the books of Prof. Holmgren and Dr. Jeffices, procured Dr. Thomson's stick of Berlin wool-tests, and thought myself equipped for preliminary investigations. I have now tested twelve hundred persons, and have found among them twenty who were either red or green-blind. The two sexes were equally represented in the number tested. Among the six hundred Chinese women, I found only one who was color-blind by Thomson's tests. This woman was completely green-blind; and all her four sons were color-blind,

—the eldest three completely green-blind and the youngest, completely red-blind.

Among the six hundred men tested, nineteen were found to be color-blind. This number includes the four sons of the color-blind woman just mentioned.

Of these nineteen men, thirteen were completely green-blind, five were completely red-blind, and one was incompletely red-blind. The last man was a brother of one who was completely red-blind. The nineteen color blind men included eleven farmers, two teachers, two students, one hospital assistant, one preacher, one mason and one boatman.

By taking the forty skeins of yarn, which are suspended upon Thomson's stick, and piling them in confusion upon a white cloth, I was able to observe, as recommended by Holmgren, the action of the hands in the selection of colors; while the brass tags upon the skeins helped me to make quick record for future reference and comparison, of the selections made by each individual. I did not in testing use the names of the colors; but I first held up the green sample skein, and said: “I am going to pick out, from the pile of yarns, all that are of the same color as this one, whether light shades or dark. Then I shall mix all the yarns together again, and ask you to pick out the same ones that I picked out.” When I had taken out all the green yarns, I asked all to look sharply at them, so that they might easily recognise them again. By first showing what I wished them to pick out of the pile, I saved much time in the testing of the normal-eyed, while I gave no undue assistance to the color-blind.

Upon those found to be color-blind, the tests were repeated, often many times. One color-blind man was very desirous of learning how to distinguish the colors, and as he was at leisure, he remained by my side and gave close attention while a hundred other persons were tested, and yet, after having been repeatedly allowed to “try again,” he made precisely the same mistakes as in his first examination. To green, he

not only added the usual "colors of confusion" but also pale pinks; while with pink, he invariably matched bright blues, without adding any of the greens. This young man, like many others, made marked efforts to discover differences in the fibres of the wools, or to find some other means of distinguishing the skeins otherwise than by their color. Nine others of the twenty color-blinds, in the first test also matched green with pink; but of these nine, eight were proven by the second test to be green-blind, matching pink with green.

In all cases where there was doubt of the patients clearness of vision, tests for form were applied before the tests for color.

I have, following Young and Helmholtz, set down as red-blind all those, who in the second test matched pink with blues only; and have set down as green-blind those, who in the same test matched pinks with greens alone, or with both greens and blues. Nine among the thirteen set down as green-blind matched pink with both blue and green.

The persistence with which more than half of the twelve hundred persons tested matched green with blue is remarkable. Even the brightest blues were added to the selected greens after repeated injunctions against so doing. While the tests established the fact that a much smaller percentage of Chinese women than of Chinese men are color-blind, yet those men, who by their outdoor lives had gained a greater degree of mental training than is possessed by their secluded women folk, chose the correct colors as rapidly as did the women, and no oftener added blues to greens.

While there was an almost universal lack of discrimination between green and blue, two colors distinctly named in their own language; the tests afforded by Thomsons skeins, prepared expressly for testing railway employés for red and green blindness only, were insufficient to prove what I now suspect—that many Chinese are violet blind.

The number examined, twelve hundred, is too small to rely upon for a percentage of red and green blindness among the Chinese. Further tests would add nothing to its value unless subjection to the examination were made compulsory, for many of the color-blind would avoid being tested through fear of appearing stupid before their neighbours. Moreover, the dislike of the Chinese to everything which is not evidently profitable and their dread of evils that may come to them through occult influences, make it difficult to test any large number. Those examined by me were mostly members of the mission schools, and patients in the mission hospital, together with the dwellers in some hamlets, where I endeavored to omit no one from the test."

My own experience has been as above in regard to unwillingness to be examined. Such ignorant folk may best be approached by persons in authority, or by missionaries, doctors, and teachers who have lived long among them, and gained their confidence. Native priests might be used to advantage to control the people.

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