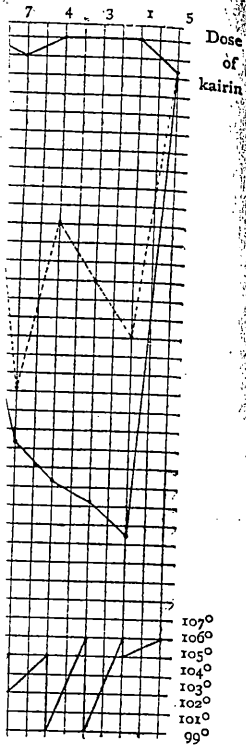


FIG. 4.



plain. The conditions of the experiments were always the same.

When dealing with a fever excited, a true nervous fever, the reaction is increased, and it was not able to retard the movement of heat production. There were produced in the animal (No. 1) where .5 gramme of kairin was injected into the animal to stagger, with loss of legs. In the calorimeter, the temperature rose, and death ensued after the injection of the kairin.

It is evident that there is no direct relation between the curve of temperature and that of heat dissipation. The curve of temperature is a reverse of heat production and heat dissipation. Heat production may be either increased or increased production is decreased, or heat production may be decreased and the heat dissipation decreased, or heat production may be increased and heat dissipation decreased. In the case of relation of the fever, either heat production or heat dissipation is well marked.

These experiments also demonstrate that a true heat production follows heat dissipation in its ups and downs, although the drugs sometimes reverse matters, as in the antipyrin series.

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*AN EXPERIMENTAL INQUIRY INTO THE CHEST MOVEMENTS OF THE INDIAN FEMALE.**

By THOS. J. MAYS, M.D. PHILADELPHIA, PA.

THE function of respiration is a very complicated act, but is principally carried on by the movements of the thorax and of the diaphragm. The former is chiefly supplied by the intercostal nerves, which arise from the thoracic portion of the spine; while the diaphragm is innervated by the phrenic nerve, which arises from the third and fourth cervical nerves. The diaphragm has an extensive range of motion, and during a maximum contraction it has the power of more than doubling the chest capacity, and is therefore the most essential factor in respiratory motion.

While, then, from a morphological point of view there is no doubt that the expansibility of the thorax is greatest in its longitudinal direction, Boerhaave, as long ago as 1744 observed that a fundamental difference existed between male and female respiration, that the abdominal or diaphragmatic breathing is most prominent in the male, and that the costal breathing is most marked in the female. The question of greatest interest to us here is whether this difference of respiratory motion is primitive, or whether it was acquired through influences such as are known to have modified other portions of the body. Hutchinson,† who likewise paid a great deal of attention to this subject, did not pretend to explain the cause of the variation, although he did not believe that it was caused by tight dress, because he found the same to exist in girls from twelve to fourteen years old who had never worn anything tight. He admits,

* Read before the College of Physicians (Phila.), April 6, 1887.
 † Prælect. Academ., § 623, tom. v. p. 144. Ed. Haller, Amst., 1744.
 ‡ "Thorax," Todd's Cyclopædia, vol. iv., Part II., p. 1080, 1852.

however, that it may be a peculiar "reservation against the period of gestation, when the abdomen cannot allow of so free a descent of the diaphragm."

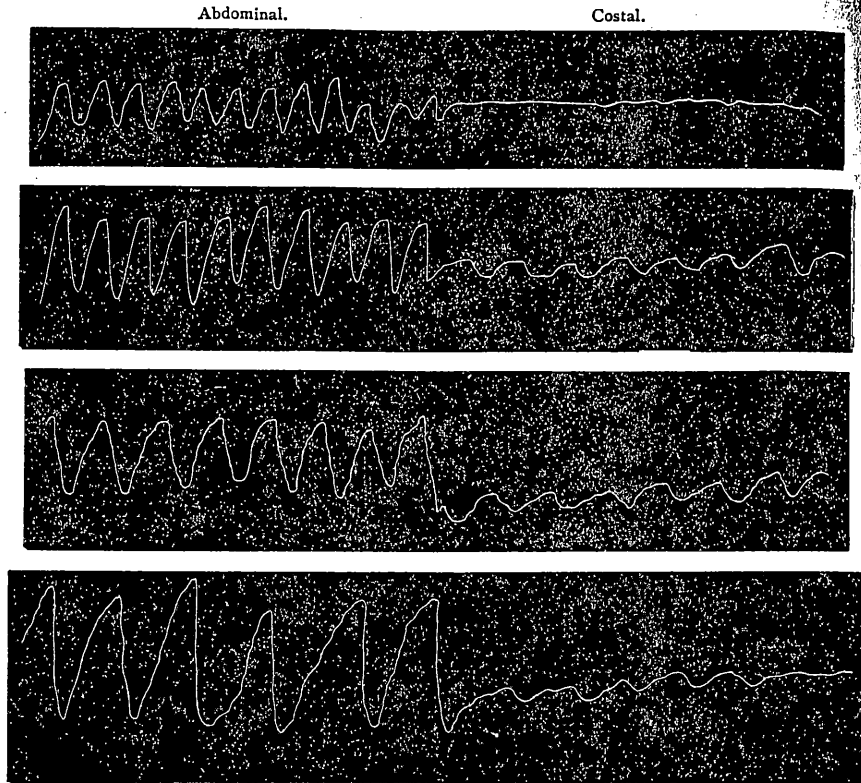
It occurred to me that an observation on the respiratory movements of females of a wild race, who had never been subjected to the constriction produced by civilized dress, would assist in solving this problem, and I feel deeply indebted to the kindness of Mrs. J. Bellangee Cox, Mrs. Chas. F. Lennig, and Mrs. Thomas K. Conrad, directresses of the Lincoln Institution, for granting me the privilege of investigating the chest movements of the Indian girls in that school. This was done by means of a pneumograph devised by me somewhat after that of Paul Bert. The instrument consists of a pair of calipers with two long and two short arms. The long arms are applied to the chest and the short arms extend beyond the pinion which binds the instrument together. Between the two short arms and by means of two small pinions an air-drum is adjusted in such a way that the slightest motion produces either a rarefaction or a condensation of the air in the drum, which being connected by a column of air with a similar drum carrying a registering lever, the movements of the chest are accurately marked on a revolving cylinder. In order to produce a slight and uniform pressure on the walls of the chest, the two long arms are connected near their union by a thin piece of elastic rubber.

In all I examined the movements of eighty-two (82) chests, and in each case took an abdominal and a costal tracing. The girls were partly pure and partly mixed with white blood, and their ages ranged from between ten and twenty years. Thus there were thirty-three (33) full-blooded Indians, five (5) one-fourth, thirty-five (35) one-half, and two (2) were three-fourths white. Seventy-five (75) showed a decided abdominal type of breathing, three (3) a costal type, and three (3) in which both were about even. Those who showed the costal type, or a divergence from the abdominal type, came from the more civilized tribes, like the Mohawks and Chippewas, and were either one-half or three-fourths white; while in no single instance did a full-blooded Indian girl possess this type of breathing.

Below will be found four tracings which are characteristic of the abdominal type of breathing as compared with the costal breathing among the Indian girls at the Lincoln Institution:

AN EXPERIMENTAL INQUIRY INTO THE CHEST MOVEMENTS OF THE INDIAN FEMALE. THERAPEUTIC GAZETTE. 1887, II. 297-99. #7060

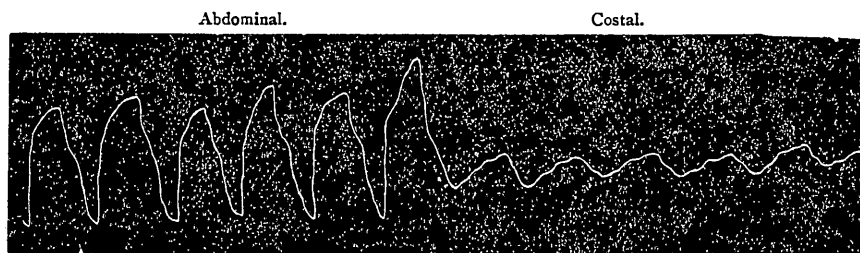
FIG. 1.—TRACINGS TAKEN FROM CHESTS OF INDIAN GIRLS.



For the sake of comparison I will append a tracing from the chest of a civilized male (adult), which bears a close analogy to those of the above

constriction could modify the movements of the thorax during respiration. At my first visit to the institution I obtained an exceptional costal type of respiration from a full

FIG. 2.—TRACING TAKEN FROM CHEST OF A CIVILIZED MALE.

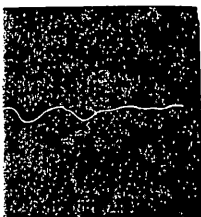
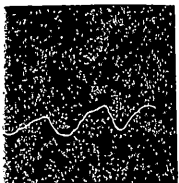
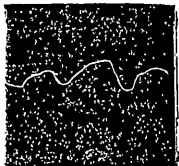
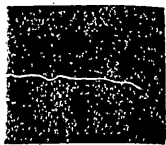


From these observations it obviously follows that, so far as the Indian is concerned, the abdominal is the original type of respiration in both male and female, and that the costal type in the civilized female developed through the constricting influence of dress around the abdomen. This is markedly shown in the greater prominence of the costal movements in those girls who were either one-half or three-fourths white, and who were hence dominated to a greater or less extent by the influence of civilized blood. While these tracings were taken an incident occurred which demonstrated that abdominal

blooded Indian girl. At my next visit I concluded to repeat this observation, and found that, contrary to my instructions concerning loose clothing, etc., this girl at my first visit had worn three tight belts around her abdomen. After these were removed she gave the abdominal type of breathing which is characteristic of nearly all the Indian girls.

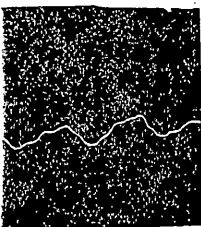
It is also very evident that the costal type of respiration in the civilized female is not due to the influence of gestation, as was believed by Boerhaave, Haller, and Hutchinson; for the influence of this process obtains

GIRLS.



modify the movements of respiration. At my first trial I obtained an exception of respiration from a full

MALE.



girl. At my next visit I repeat this observation, and try to my instructions concerning, etc., this girl at my next visit I put on three tight belts around her chest. After these were removed the normal type of breathing was evident. The characteristic of nearly all the Indian

is evident that the costal type of respiration of the civilized female is not the same, as was observed by Haver, Haller, and Hutchinson. The influence of this process obtained

is much among the uncivilized as it does among the civilized people, yet my observations fail to confirm such a view in the least.

What practical bearing, then, does an immobile thorax have on health and disease? In a former communication* on this subject I endeavored to show that one of the principal factors in the causation of pulmonary consumption is an inactivity, or a want of expansion of the upper portion of the lungs. Now, is the want of expansibility in the lungs of these Indian girls a mere coincidence, or is there a causal relation between it and pulmonary consumption? I think the existence of the latter relation is almost certain when we take into consideration the fact that the death-rate from this disease among those Indian tribes who have most recently come in contact with civilization, and from whom these school-children are chiefly obtained, is nearly double that of the white race. There is little doubt that the Indian in his native wild state is almost exempt from pulmonary disease, as is well attested by the history of those tribes who are living now as they have lived for three centuries or more, but his first contact with civilization surely disintegrates him. His habits and customs are entirely reversed. His life of physical activity, which was exclusively carried on in the open air, and which had a tendency to stimulate and to develop his respiratory organs, is now exchanged for the reservation, where he is housed and fed, his roving instincts checked, and where he soon sinks into a state of listless mental and physical apathy, and from which he readily merges into confirmed pulmonary disease.

Starting from these premises, our path of duty, when considered in relation to the prevention of pulmonary disease among these Indian children, lies straight before us, and this is in the direction of increasing their chest capacity. This can undoubtedly be best accomplished in the first place by daily inhalations of compressed air in accordance with the Waldenburg method; secondly, by gymnastic exercise, which is calculated to develop the muscles of the chest and of respiration; and, thirdly, by allowing them an abundant supply of fresh air both day and night.

One more point deserves attention. What is the influence of such abdominal constriction as is practised by our civilized female

* "Some of the Causes of Pulmonary Consumption viewed from a Darwinian Stand-point," *Med. News*, November 27, 1886.

on the respiratory function? Is it detrimental to health, or is it not? If, as is shown by my experiments, that interference with the motion of the diaphragm produces a compensatory breathing in the costal portion of the chest, does not this tend to antagonize or counteract the sluggish respiratory movement of the lung apices? Is there any intimate relation between this induction and the fact that proportionally, and as a rule not without some exceptions, a less number of females than males die of pulmonary consumption?

NOTE.—My warmest thanks are due to Mrs. Walters and Miss Pine, teachers at the Lincoln Institution, as well as to Drs. Burnett, Bliss, and Mr. Kyner, for their kind assistance in the prosecution of this work.

1716 CHESTNUT STREET.

RESULTS OF THE USE OF CASCARA SAGRADA IN FIFTY CASES.

By M. H. FUSSELL, M.D., PHILADELPHIA, PA.

SINCE this drug was first brought prominently before the profession, the columns of our journals have been crowded with articles concerning it. I have been so firmly convinced of the great value of the drug as a laxative, however, that I do not hesitate to add to this already great number. During my term of service in the Medical Dispensary of the University of Pennsylvania we have used the drug largely in my room, almost to the exclusion of other laxatives.

I have selected these fifty cases because they were the longest under observation, and not because they all showed favorably to the drug. Indeed, I have taken care to include all the unfavorable cases whatever the time they were under observation. The preparation used in all cases was the fluid extract.

The beginning dose in all cases was gr. xx t. d. Of the fifty cases the drug was useful in forty-three (43).

It entirely failed in seven (7).

In the forty-three favorable cases the dose of the drug was diminished, after using a longer or shorter time in twenty-nine (29) instances.

The original dose was continued in fourteen cases.

In no instance was it found necessary to increase the dose, which by trial was found sufficient to cause a daily evacuation of the bowels.

By referring to the summary of cases, it will be seen that when the drug failed the