

The immediate effect was excellent. At the end of three weeks a greater portion of the swelling had subsided. The pain and tooth tenderness had gone to such an extent that he was able to smoke a pipe again. The only reaction to the radium up to this time was a redness and a slight tenderness of the hard palate on the treated side and a small radium burn on the tongue. The hair on the cheek and the left half of his moustache was beginning to fall out.

December 23, 1919.—On this date 50 milligrams of radium were introduced again by the same method and with the same screening and dosage. This gave a total of 2400 milligram hours within a closed cavity in less than five weeks' time. At this time exploration of the cavity of the antrum with a dull curette revealed little of the soft tissue that had been present so plentifully before.

Three weeks after the second treatment a period of three months of extreme suffering began. At this time the opening into the antrum enlarged from necrosis and drainage from the antrum was maintained. The cavity was flushed daily with a warm boric acid solution. The few remaining teeth on that side loosened and came out. The hard palate up to the median line and the alveolar processes gradually sloughed away, leaving borders of necrotic tissue flapping in the mouth. Although the necrotic process was continuous there was little odor and nothing of the characteristic fetor of carcinoma. Surgical consultation resulted in the advice to let things alone but in another similar case I should insist on operative removal of the necrotic tissue which could be done with comparative ease.

The constitutional effect upon the man himself was most striking. It is best described as a mental dulling and a complete physical failing. Eating was, of course, most difficult, anyway, and his appetite disappeared completely. He had to be urged to take even eggs and milk. His memory failed and his mind became childish. The pain was so extreme as to demand morphine over a period of several weeks. This pain appeared over different areas on the head, a favorite location being the top of the head. He described the sensations as those of severe burning and swelling as if the top of his head was going to blow off. He would try to allay this with the constant application of ice. He was confined to his bed for the last month of this three months' period. The eye on the involved side was not affected at any time. His weight fell from 180 to 130 pounds. A fatal termination seemed the only possible outcome to family and physician alike. On one Sunday forty-five relatives and friends came in to bid him farewell and he remarked cheerfully, months afterward, "it seemed more like a wake than a visit of comfort to a sick man."

On the following Tuesday morning a very large mass of sequestrum came away and Mr. C. tells that from the moment it was out he began to improve. He got out of bed for the first time for a month, that same day, and his appetite came back immediately. The final result was complete removal of the antrum and its surrounding structures from the mouth to the orbit. The normal tissue healed readily and no further treatment or procedure has been necessary. Within a comparatively few weeks he was back at his work and he felt as vigorous as he had been all his life. His weight returned to 185. His speech is thick and difficult to understand and he has some trouble in eating, but for the present he declines any prosthetic device to help this condition. No recurrence has appeared in the twenty-two months that have elapsed since the second treatment on December 23, 1919.

#### REFERENCES.

- <sup>1</sup> Davis: "Malignant Growths of the Upper Jaw and Antrum." *Lancet*, 1920, No. 2, p. 1090.
- <sup>2</sup> New: "Treatment of Malignant Tumors of the Antrum." *Jour. A. M. A.*, Vol. lxxiv, p. 1296.
- <sup>3</sup> Phillips: "Primary Epithelioma of the Antrum of Highmore." *Jour. Laryngol., Rhinol., and Otol.*, 1898, Vol. xiii, p. 325.

### MONITOR VENTILATION.\*

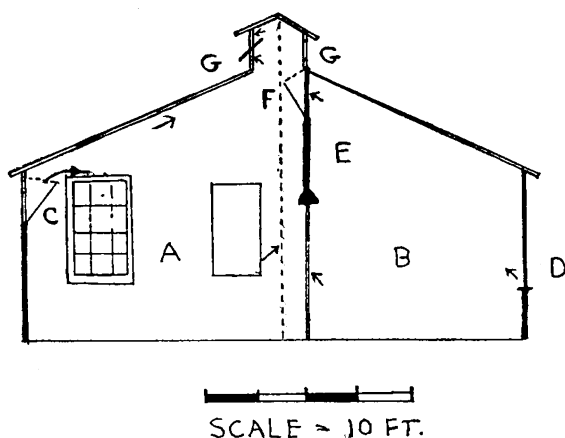
BY WALTER A. GRIFFIN, M.D., SHARON, MASS.

IN monitor ventilation there is nothing new or untried. The principle is at least as old as this continent, for the Indian, in his wigwam, which, as you remember, was built in the shape of a cone with an opening at the apex for the escape of smoke, had a very good example of it. We are also familiar with it in our every day life although we may not have given it particular attention. For example, nearly all railway coaches have windows near the roof, and if they were not so provided traveling would be unendurable at times. Again, those of us who are at all familiar with the country know that old barns were usually built with a cupola as an aid in carrying off the various foul smells arising from the animals. As a means of ventilation, however, for buildings, such as halls, theaters schools and hospitals, there seems to be but little general knowledge of this system, very possibly because there are so few examples of it. In fact, of the numbers of people who have visited the Sharon Sanatorium I have not found anybody, either layman or physician, to whom our monitor system in the children's ward did not seem to be a new thing. It is well worth while, therefore, to consider at this time this new-old method of ventilation.

The object to be sought in any system should be to rival as far as possible the purity of the outside air. Practical hygienists have seemed to give most of their attention to a considera-

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tion of the various deleterious matters which are to be found in confined air, to measure these substances, and to set arbitrary standards of permissible pollution in such confined air. For years the index of impurity was expressed in amounts of carbon dioxide present and it was generally considered that if the amount of this compound in any place of assembly did not exceed a certain amount the air was pure enough for human needs. Later on, it became evident that the carbon dioxide content was not so important as had at first been thought and attention was given to the odoriferous emanations given off by the body. These, naturally, were very hard quantitatively to estimate. At present we are told that neither carbon dioxide nor body odors are of real importance, but that ventilation, to be successful, should keep body heat and humidity below a certain level, so that, practically, good ventilation means good heat elimination.



Side elevation of ward and sleeping porch of children's department of Sharon Sanatorium, showing ventilating system. The height from the floor to the top of the monitor is 15 feet. Arrows show direction of air currents.

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|----------------------------------|---------------------------|
| A. Ward, 13 feet wide.           | E. Partition.             |
| B. Sleeping Porch, 10 feet wide. | F. Sash.                  |
| C. Sash, 8 inches deep.          | G. Sash, 12 inches deep.  |
| D. Screen.                       | G'. Monitor sash, closed. |

It is a matter of common knowledge that in any hall or assembly the air in the balcony seems more vitiated than the air upon the floor. It is certainly hotter and also it is more foul, because of the odors which arise. Further, we all know that in case of fire the first instruction is to get as near the floor as possible to escape suffocation. It is probably true, as well that in the upper strata of air there would be more carbon dioxide; for it is against reason to expect that a gas so little heavier than air will be found near the floor when there is any degree of heat, and where several people are gathered together the heat arising from their bodies will cause enough upward currents to carry much of the carbon dioxide with it.

Giving due consideration to these previously mentioned theories, let us consider how we may ventilate a square box of a room such as might be used for school purposes.

If we are to obey the law in Massachusetts, we are limited in our choice of ventilation to the plenum system or some modification of it. The law directs that there shall be outlets near the floor which shall insure the removal of two and one-half cubic feet of air per minute for each foot of the room. There shall be "inlets" for pure air equal to the amount removed, and at such height from the floor as to "insure proper circulation." If the room is to be used as a school the air may be supplied by pressure through the floor and the outlet may be through grills in the ceiling. These two methods are the only allowable ones in Massachusetts. That the standard we have mentioned, namely, that the air of the room should rival in purity the air outside, is far from maintained, is perfectly evident to anyone visiting a school after a class has been in session for an hour or more. If it did, there would be no need to consider fresh-air schools. The efficacy of the plenum system was thoroughly tested at the Massachusetts Hospital School in Canton by the superintendent, Dr. John E. Fish, some years ago. Certain rooms, as thoroughly equipped as possible for ventilating by this system, were filled with a dense smudge and it was found that they were cleared of the smoke only after thirty minutes. The fact that smoke was not thus removed would make us believe that the other deleterious substances were not removed.

Apparently, Connecticut is more liberal than Massachusetts because at Fairfield, in that state, there is a school in which the windows may be raised somewhat and the air currents diverted upward by glass guards placed a few inches inward from the sash. There are, in addition, openings on the inner wall near the ceiling for the vitiated air to escape. Those who have visited the school claim that it is far superior to the usual system of ventilation. The reason for its efficiency may be found in the fact that it is, in reality, a modified monitor system.

We may, however, ventilate our square room by taking out all the windows on one or more sides. We should then have an open-air school and it would be necessary to provide special protection for the pupils in cold weather. Occasionally there are times, with the windows removed from one side only, when pocketing of air in the far side of the room may occur. Dr. Fish also tested this possibility by making a smudge test with the model and found that with one side removed and a gentle wind blowing the smoke stayed banked in the farther side of the model for a considerable period.

Finally, we might ventilate the room by an opening in the ceiling and we should then have the beginning of the monitor system. We should find, however, that in order to remove the vitiated air best the ceiling should be raised in its center to a peak like the ceiling in the

attic of a house. Dr. Fish made some experiments in sleeping wards with this system of ventilation, and found that a dense smudge passed out of the room in a few seconds when the monitor windows were open. These experiments at the Hospital School were made in 1915 and were so conclusive that no building has since been erected on the grounds of that institution which did not have the monitor system of ventilation. Many of the buildings were experiments in architecture and frequently far from pleasing to the eye, but the ventilation in all of them is perfect; that is to say, the system does what no other system has been known to do—it makes the air inside the buildings seemingly as pure as out-of-door air. At no time can foul odors be detected, nor can any odors which arise from the cook stove, which is placed directly in the center of several of the buildings, be detected in any other portions of the buildings. In the infirmary, even, where there are frequently children with foul discharging wounds, there are never any bad odors.

From our two years' experience with the monitor system at the Sharon Sanatorium, we have gained so much enthusiasm that we would not be willing to have another building constructed which was not ventilated in this way.

So far as I know, there is but one school in the country which has the monitor system. This is in Canton and was erected largely because of Dr. Fish. It has one story only and architecturally is very good looking. It has been in operation now for some three or four years and all of the teachers are exceedingly enthusiastic. Many of them have taught in other schools with other systems of ventilation and it is their impression, although no data have been collected, that the incidence of respiratory diseases amongst the pupils is much less than in an ordinary school room. I have been in the rooms during crowded sessions and could distinguish none of the customary school-room odors. The story is told, although I cannot vouch for it, that the inspectors said that they could not pass the building as it was contrary to law, to which the committee who built it replied, "We do not care, but will you condemn it?" To this the inspectors said, "We cannot condemn it because it is perfect." At any rate, there it stands, contrary to Massachusetts law—the best ventilated school in the country.

Some of the advantages of the monitor system are apparent. Where it has been used, it has solved the problem of ventilation and is very easily regulated. The air in a room equipped with it cannot be detected as more impure than outside air, and at the same time heat may be present, and in fact should be present for the success of the system, so that extra wraps are unnecessary. When used in schools, the results are practically as good as in an open air school and far less rigorous for

the pupils. With it there are no perceptible drafts, so that there is no need of extra clothing. As a ventilating system for hospitals, auditoria and other places of assembly it would be equally desirable although possibly not always practical.

Some of its disadvantages are that it will not work of itself. Some little attention is necessary to operate it with success. In that connection it happened that one cold day in early spring I made a trip to the Canton school above mentioned. In the first room visited I found an elderly teacher and four or five pupils. The monitors were closed. The air, while not bad, was not perfectly sweet. While I stood there the teacher opened the monitors a moderate degree, and inside of thirty seconds the air was perfectly fresh and good. On the other hand, if the monitor system will not work of itself, neither will any other system, so that this objection to it falls by its own weight. Another disadvantage is that many architectural problems are presented where more than a one-story building is erected, but these are not insurmountable. One other disadvantage is that a little more heat is required, but this is not excessive in amount, and a few tons of coal additional is hardly to be put in the balance with strong bodies and more active minds. Still another objection may be that it would be hardly practical in certain noisy or dirty places in the city. It is very possible that the plenum system would be found necessary to properly ventilate many such buildings, but monitor ventilation could doubtless be modified to fit particular needs so that better results could be had at a less cost. Its use has only begun. As it becomes better known there is small doubt that the demand for it will grow, that architecturally it will be made pleasing and that those who fail to use it in public buildings will be required to give good reason for the substitution for any other method of ventilation.

## PESSARY WORN WITHOUT REMOVAL FOR ELEVEN YEARS.

BY CHARLES J. KICKHAM, M.D., BOSTON.

It is not often that a case comes to attention where a foreign body has been retained in the vagina for several years without serious damage resulting. It is the first case of the kind which has come under my immediate care; though we all have seen cases where the patient has retained a pessary for several months, with marked local symptoms.

Miss M. O., aged 38, single, clerk. Past History—Eleven years ago was operated on for dysmenorrhea; at that time a dilatation and curettage was done and a pessary inserted to replace a retroverted uterus. The patient