uncommon causes for backpain. The bacteria and toxins in the prostate and seminal vesicles may free themselves from their places of hiding, enter the blood stream and lodge in the terminal arteries of the joints or in the capillaries of the muscles, fasciae and joint capsules. These connective tissues become the seat of inflammatory hyperplasia with exudation and proliferation of the fibrous tissue elements. If the foci of infection are discovered and eradicated early the local inflammation about these joints undergoes resolution even without the aid of therapy to the back; if, however, the urological focus is neglected and becomes chronic the inflammatory exudate organizes, leads to the formation of adhesions and, later, to contracture of the connective tissue. Stiffness and pain on motion of the lower back is the result of this pathological process. Besides "fibrositis" (as this process may best be termed) of the soft tissue of the small of the back, a contributory cause of backache is the faulty posture which patients with inflamed pelvic organs assume in standing and walking. Muscle strain is the consequence and backache, the complaint. On the other hand, flat feet and faulty posture may have preceded the urological ailments; the backache of the former causes becomes aggravated through the addition of the latter ones.

L. P. PLAYER, M. D. (384 Post Street, San Francisco)—Kutzmann has made a very clear and concise statement of the case, and his classification of the causes of backache should be of some assistance to the general practitioner in his diagnostic efforts.

Back pain due to causes mentioned under the first and second classifications present problems in differential diagnosis that require exhaustive study; however, in proportion to the total number of cases these form a small percentage.

It has been my experience that the largest number of cases fall into the metastatic group with other focal infections.

DOCTOR KUTZMANN (closing)—It was not the purpose and scope of this paper to emphasize any particular cause of backache, but rather the many that may enter from the urological point of view. I have tried merely to bring out the possibilities that can be concerned as etiological factors, so that such general diagnoses as "lumbago," etc., will not be made. The emphasizing and enhancing of the various factors by the discussants is therefore appreciated. The urogenital tract in many cases is a factor in the causation of backache and should not be lightly dismissed because the symptoms or signs do not point directly to it. The performance of a careful urinalysis, rectal examination or x-ray examination of the urinary tract will often give to the alert physician some clue that can be followed to a positive diagnosis. I wish to thank Doctors Day, Hinman, Gottlieb, and Player, for their excellent discussions.

Ill Chosen Advocates—The effrontery of the opponents of vaccination and vivisection has been displayed with a customary disregard of principle and sensibility in the activities of the Caruso Defense Committee. Under the leadership of Alexander Marky, a son-in-law of MacFadden and adherent of many of his views, a group of "antis" have been exploiting the emotional aspects of the Pendola murder for the dissemination of anti-vaccination propaganda.

Those who are genuinely concerned over the impending fate of Caruso will regret the entry of the anti-vaccinationists into his defense. They are the one group that have no right to plead for leniency in a case of this kind. The lurid misrepresentations that they habitually spread are designed to arouse the passions and prejudices of just such ignorant and confused mentalities as Caruso's. When a tragedy like the Pendola death occurs, the best that they can do is withdraw from the public eye and maintain a discreet silence.

The murder of the young physician, who had done all within his power to save the moribund child, was an appalling crime. If mercy is sought for the slayer, it cannot be asked on anti-medical arguments, but because of the inordinate ignorance of the killer. The Pendola murder is not fit grist for the anti-vaccination mills.—*New York Medical Week.*

A CLINICAL INTERPRETATION OF PULSE PRESSURE*

By J. MARION READ, M. D.
San Francisco

ABOUT twenty years ago the sphygmomanometer was added to the physician's armamentarium, thus enabling him to measure the blood pressure with considerable accuracy. But with this instrument of precision, as with other mechanical aids to diagnosis, the perfection of technical methods to measure deviations from the norm has outstripped our ability to interpret correctly the meaning of these deviations. This has seemed to be particularly true regarding the deviations of blood pressure from the accepted standards.

The clinical observations reported here are submitted as further evidence supporting the conception that a relationship exists between pulse pressure and ventricular systolic output.

Numerous investigators have shown that in hyperthyroidism the tachycardia varies in degree directly with the metabolic rate. It seems reasonable to suppose that this increased heart rate is an adaptation for increasing the volume of blood pumped out by the heart per minute, since the minute volume of the heart is known to be increased in this condition. But the pulse pressure also varies directly with the metabolism, as I have previously shown. An analysis of one thousand observations of the pulse rate, blood pressure and metabolic rate, made simultaneously under basal conditions, showed that the rise in pulse pressure with increasing basal metabolio rate is due to rise in systolic pressure, since the diastolic pressure remains practically constant. The pulse rate and pulse pressure both increase in a parallel manner with elevation of the basal metabolic rate.

When gathering these data it was observed that some subjects showed a disproportionate increase in either pulse rate or pulse pressure, with little or no change in the other. This suggested that some individuals might increase the minute volume by increasing the rate of systole per minute, while others accomplished the same increase in total blood flow by increasing the volume ejected into the aorta at each systole. Pulse pressure might then be a rough measure of stroke volume.

Recently there came under observation two individuals with complete heart block, as shown by electrocardiogram, neither of whom suffered limitation of activity imposed by circulatory insufficiency. One was a woman, 47 years old, whose slow pulse had excited interest since girlhood. P. R. 36-44, blood pressure, systolic 180, diastolic 80. The other was a man, 70 years old. P. R. 28-30. Systolic pressure 200-240; diastolic 70-100. Neither had aortic insufficiency.

The normal diastolic pressures in these subjects and the lack of any circulatory embarrassment, with moderate cardiac enlargement suggested that the blood pressure changes were adapted to permit an

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adequate minute volume even with a pulse rate reduced to about half the normal.

In summary I will say that the minute volume of the heart being the product of heart rate and stroke volume, may be varied by altering either one or both of these factors; augmented blood flow results from an increase in one or both; and diminished flow follows a decrease in one or both. Proproportionate changes in both, but in opposite directions, tend to maintain a constant minute volume. I have shown that in certain conditions alterations in pulse pressure occur which are in the same direction as one would expect stroke volume to vary in these conditions. While pulse pressure is not a measure of systolic output, its direction and magnitude of variation seem to parallel the changes in output.

870 Market Street.

THE INDICATIONS FOR SURGERY IN THE TREATMENT OF HAY FEVER AND ASTHMA*

By SAMUEL H. HURWITZ, M. D.
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DISCUSSION *by Wallace Bruce Smith, M. D., San Francisco; Irwin C. Schumacher, M. D., San Francisco; Harold A. Fletcher, M. D., San Francisco.*

IF one judge from current literature as well as from discussions with colleagues familiar with this subject there is still considerable difference of opinion as to the value of surgical procedures in the treatment of hay fever and asthma. That the rhinologist and otolaryngologist should have played so important a part in the treatment of these patients is not surprising in view of the peculiar localization of their symptoms. Patients having prolonged attacks of sneezing, accompanied by an almost constant and profuse watery or mucoid discharge with nasal obstruction or headache, naturally seek relief from these symptoms by local treatment, and because of the widely disseminated view of asthma as a nasal reflex the surgical specialist also has been called upon to treat many of these sufferers.

That the many operative procedures employed, which include removal of polypi, amputation, excision and crushing of turbinates, straightening of septums, and more or less radical operations on the nasal sinuses have not always given results satisfactory enough to justify them is clear from the reports not only of internists and allergists, but also of nose and throat specialists themselves.[1 2 3 4 5] An unbiased and critical answer to the question as to when surgery is indicated in the treatment of the patient with hay fever and asthma is not to be found by making, on the one hand, a statistical survey of the good results obtained by surgical therapy in these patients, nor, on the other hand, by citing the many instances of relief from symptoms by constitutional or other modes of treatment. This problem should be studied from a broader viewpoint. A proper evaluation of each form of treatment, either alone or in combination, can be had only by a consideration of the constitutional factors and the nasal lesions underlying the symptoms for which the patient seeks relief.

CONSIDERATION OF INDICATIONS FOR SURGICAL TREATMENT

For purposes of clearness and brevity the subject of the indications for surgical treatment will be discussed under the following headings: 1. The Rhinologic Aspects of Allergy. 2. The Rôle of Nasal Anomalies and Infection of the Upper and Lower Respiratory Tract in Relation to Surgical Treatment. 3. Nasal Reflex Asthma and Surgery. 4. Summary and Conclusions.

I.

THE RHINOLOGIC ASPECTS OF ALLERGY

The last decade has witnessed a remarkable clarification of our knowledge of the causes underlying a certain group of diseases which we now designate as allergic. Although we are still in the dark as to the importance of the sympathetic nervous system, the endocrine glands, and certain physical and chemical agents in relation to allergy in man, we do know that most of the instances of hay fever, seasonal and perennial, and that more than half of all the asthmatic conditions result from an inherited hypersensitiveness to protein substances.

Allergy has been defined as a natural and not infrequently inherited state of human hypersensitiveness to proteins. Whether the protein is inhaled, thus coming into direct contact with the mucous membrane as in the case of pollen proteins and the proteins of cereal grains, animal hairs and dusts, or what is not so frequently realized, ingested in the form of food proteins, the reaction of the mucous membranes is the same. The latter is also true whether the reaction manifests itself in the upper or lower respiratory tract. Thus, in hay fever the sensitization exists primarily in the mucous membranes of the eyes and nose, whereas in asthma the membranes lining the bronchial tubes are the seat of this hypersensitiveness. It is rare, however, for a patient to show sensitization in only one of these localities. More commonly there is evidence of involvement simultaneously or consecutively of the cells of several membranes. Indeed, more than half of the hay fever patients develop bronchial asthma, due to irritation and congestion of the bronchial mucosa, analogous to that observed in the nose and throat.

The pathological changes in the respiratory mucous membrane, and more particularly the microscopic appearance of the nasal mucosa of an allergic individual exposed to a protein to which he is sensitive has been well described by many rhinologists. According to most observers, patients with seasonal or perennial hay fever may show either a simple turgescence of the nasal cavernous tissue with an increased secretion of mucus or serum, a picture not infrequently seen in non-allergic rhinitis, or in the more aggravated case, a marked pallor. This pallor is usually but not invariably accompanied by edema. Inspection of the nose shows great obstruction, often complete, resulting from the edematous, pale, mu-

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*From the Department of Medicine, Stanford University Medical School, San Francisco.

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