One could continue to multiply examples of conditions in which this dangerous complex may arise. Apart from agents directly toxic in themselves, the position is complicated by the fact that, when blood is subjected to injurious influences, as by contact with otherwise inert substances acting as "foreign" surfaces, so that processes are initiated in it which, outside the body, would lead to clotting, it acquires a toxicity of this type. (*Cf.* Novy and De Kruif,²⁹ Dale and Kellaway.²³)

When you also remember that, apart from dilatation and increase of permeability of the capillaries due to loss of their contractile tone, effects at least superficially similar can probably be produced by substances which directly poison the endothelial wall and disorganize its delicate structure, it will be obvious that there may be difficulty in deciding as to the precise nature of a particular effect. Salvarsan, for example, as an arsenical derivative, may, and in some cases probably does, act as a direct endothelial poison. It is also a colloidal substance which, on injection, may be so precipitated in the blood as to initiate pre-coagulation changes. Both types of effect probably figure among the toxic effects which salvarsan occasionally produces.

Unfortunately methods of dealing effectively with dilated and permeable capillaries are not easy to find. The action of adrenaline, above mentioned, suggests itself; and there are cases in which it seems to have value. As a prophylactic or a remedy for the immediate, so-called vasomotor, reaction sometimes produced by salvarsan, for example, there seems to be no room for doubt that adrenaline is effective; and its effectiveness supports the suggestion, made on other grounds, that this type of reaction is due to capillary dilatation caused by pre-coagulation changes in the blood, and not to poisoning of the endothelium. Calcium has had a reputation for reducing the tendency to excessive permeability of the capillary walls. Krogh's recent evidence as to the tonic action of pituitary extract should find some therapeutic application. Experience during the war, however, presented as practically insoluble the problem of restoring the volume of blood in effective currency when once the capillaries had become thoroughly lax and permeable. Saline solutions, gum saline, or even blood itself, often produced but a temporary recovery of volume, the fluid escaping from the vessels, or becoming removed from circulation, almost as fast as it was infused into the veins. In some of Dr. Harding's experiments, in the investigation already mentioned, there could be seen what appeared to be a secondary, and rapidly fatal, accentuation of the toxic collapse, when blood which had lain stagnant in toxæmically dilated capillaries was washed back into circulation by an infusion. The therapeutic problem is a peculiarly difficult and complex one; but the first step towards its rational solution is a clear recognition of the nature of the condition calling for treatment.

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ENDOCRINES, VITAMINS, AND
SUBTLETIES.ABSTRACT OF AN ADDRESS DELIVERED TO THE SUNDERLAND
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BY

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IN no branch of knowledge is it more difficult, certainly in none is it more necessary, than in ours, to get the spirit of the moment into its right perspective. Between the excited welcome accorded to new therapeutic methods on the one hand, and the obstinate impermeability to fresh ideas on the other, the plain man is apt to be bewildered, and it is well that he should occasionally pause to consider on what sort of ground he is standing and whither the pathway seems to be leading. It is with the hope of affording some help in this direction that I have prepared this paper, and such must be my excuse for the very comprehensive title.

I.

In the matter of the first subject, endocrinology, I would like to emphasize at the outset the important fact of the interdependence of the glands which constitute the system. I am fond of comparing them to the eight rowers in an out-rigger boat, with the central nervous system as cox. These rowers are all pulling in the same direction; they are, nevertheless, some of them, pulling one against the other. Now, in our clinical dealings with these glands we are much too apt to regard each as an independent entity, instead, as we ought, of considering each as a member of a hierarchy, the whole of which is liable to be deranged when one of the members is seriously affected. As bearing on this generalization, let me indulge in another. It is the evil fashion to speak of "hyper" or "hypo" functioning of certain glands. Such a nomenclature expresses but a part of the truth, and that part a very misleading one. It is no doubt true that in the various degrees of myxoedema, for example, the thyroid is primarily at fault, but the outstanding symptom which brings the patient to the doctor may point insistently to failure of some other gland.

Quite recently a man of 45 came to me complaining of sexual impotence gradually acquired. He turned out to be a case of mild, atypical myxoedema, appropriate treatment for which rapidly restored his sexual capacity. It also restored his domestic peace, which had been seriously impaired by unfounded charges of infidelity.

Now, misleading as it generally is to speak of underaction of a particular gland, it is much more misleading—it is, indeed, generally a misstatement—to speak of overaction of any single gland.

Let us take the thyroid again. It has become a habit with many, who ought by now to know better, to speak of Graves's disease as synonymous with hyperthyroidism. Now, although the thyroid gland may be overactive in Graves's disease, it is so in common with other glands, notably the suprarenal, the pancreas, and the thymus, and the salient symptoms of the disease are due much more to the latter than they are to the thyroid, which, as you know, is frequently not even enlarged. Whatever else it is, or is not, Graves's disease is not a pure hyperthyroidism.

In the matter of underaction it is generally evident that one gland is primarily at fault; in the matter of overaction that is seldom the case, except where there is a definite and local organic irritant, such, for example, as suprarenal and pituitary tumours. The cause of overaction is generally a toxæmia which irritates not one gland only, but many, though in different degrees. In looking for a cause of underaction it is always well to remember the possibility of long-continued toxæmic overaction, leading to exhaustion of the gland or glands in question. This is a frequent cause of thyroid insufficiency, because the thyroid above all others is concerned in combating endogenous toxins. That it is a cause of pituitary insufficiency I hope to show presently. Then again we must always bear in mind that when we have given, say, thyroid extract with success, our good results do not necessarily mean that the patient was lacking in thyroid essence. The good results may mean, and in many cases

I am sure they do mean, that the extract has stimulated an opponent gland—say the suprarenal or the pancreas—to increased effort. So that in giving the extract we are not supporting a flagging thyroid, we are rousing a lazy suprarenal. We are, in fact, restoring the balance by indirect means.

With these preliminary reservations we can proceed to consider a few of the glands individually. First, then, as to the thyroid. Here we are entitled to speak of a primary insufficiency. We know that there are many clinical manifestations of this condition; such are the troubles in the skin and its appendages, the slow pulse, the sensitiveness to cold, the muscular fatigue, the mental hebetude, the intestinal stasis, the menstrual disturbances, and in children night terrors and nocturnal enuresis. Hertoghe, of Antwerp, long ago pointed out that these and other symptoms might all be reduced to a causal common denominator which is expressed by the word "infiltration." The thyroid is the great activator of metabolism, and when the fires burn too slowly material is deposited in various tissues. We may call this material mucin if we like; its name is less important than the fact that it is a product of inadequate metabolism which is liable to be deposited, capriciously so far as we can see, in any tissue or system, thus giving rise to very diverse findings. Just as a person with a high blood pressure may bleed from anywhere, so a person with thyroid insufficiency may become infiltrated anywhere. The selection of the site of the infiltration is even more difficult of explanation than the selection of the site of the haemorrhage. And when we consider the matter, it is not difficult to realize that a very slight degree of infiltration may bring about serious results. A slightly infiltrated endocardium, an infiltrated intestinal mucosa, an infiltrated endometrium, may very easily produce a train of symptoms sorely baffling to the clinician who fails to remember slight thyroid insufficiency and its powers of depositing unwelcome material in unsuspected and unlikely places. With this general outline in view, it is possible to form a mental picture of the method of production of almost any of the many morbid manifestations which we have come to associate with thyroid inadequacy, but in so doing we must be careful not to forget the possible responsibility of other glands for some, at any rate, of the details of the complete picture. Of the thyroid, more than of any of its congeners, it may be asserted that when it fails to ring true, the others inevitably become jangled and out of tune. It is the leader of the glandular orchestra.

This statement, correct though I believe it to be, seems less so to-day than it used to seem. Some years ago it was thought that the parathyroids were mere accessory or supplementary or immature thyroids, and commercial manufacturers of thyroid extract included in the product thus labelled, not only the thyroid gland itself, but the embedded parathyroids. Since it became evident that the old view was incorrect and that the parathyroids were possessed of functions distinct from, and according to some observers even antagonistic to, the thyroid proper, manufacturers have been careful to separate these glandlets from the thyroid itself, with the result that when we now prescribe thyroid extract we are exhibiting the pure article, whereas in former days we used to exhibit thyroid *plus* parathyroid. This is liable to make a serious difference in our results, and when I now fail with thyroid where I confidently expected to succeed, I generally find that the addition of a small dose of parathyroid—say one-twentieth of a grain—brings about the desired result. There are, of course, still those who deny to the parathyroids any particular part in the endocrine hierarchy. In spite of these, however, clinicians have satisfied themselves that the extract of these despised glandlets, when orally administered, does bring about very satisfactory results in certain cases. Their action may be summed up by saying that they have a very favourable influence upon calcium metabolism and on certain conditions of autointoxication; for these glands would seem to have a very definite part to play in the defensive mechanism with which the endocrine system as a whole is endowed. Clinically, parathyroid medication has been found to be exceedingly helpful in the treatment of benign ulcers, both internal and external—that is, gastric and duodenal and varicose ulcers. It is certainly very useful in tetany and in that condition of chronic toxæmia which has been called

latent tetany.¹ Its use in Parkinson's disease may or may not be attended with good results. If it fails to do good in rickets the cause is to be sought in want of skill in guiding the necessary concomitants such as diet, air, sunshine, and the like. The unsightly and painful chilblain will more often than not yield to parathyroid medication where other remedies have failed.

I have said that in looking for a cause of underaction in any gland it is well to remember the possibility of long-continued toxæmic overaction leading to exhaustion of the gland in question. Let me take an illustration from the pituitary, and in so doing say at once that the chronic overaction may own causes other than toxæmia.

There are a fair number of people going about who are so much taller than the normal as to give rise to a suggestion of giantism, men of over 6 ft. 2 in., and women of 5 ft. 10 in. To careful examination a certain number of these people will reveal present evidences not of pituitary excess but of pituitary insufficiency. They have grown rapidly, outgrown their strength as the saying is, in response to an irritated pituitary. At a given moment the relative pituitary hyperactivity dies down, to be followed by the relative insufficiency of exhaustion, and, although the balance may ultimately become redressed in some degree, that person's pituitary is always lacking in vigour, and without outside help will generally give rise to unpleasant symptoms. The preliminary excess is to be seen in the abnormal height, the spaced incisor teeth, the large hands, and the misshapen lower jaw, which is either receding or underhung, according to the age at which the pituitary excess began to die down. The existing insufficiency is evidenced by intolerance of extremes of temperature, by late oncoming, irregular and painful menstruation, by absence of half-moons on the nails and other irregularities of pigmentation, especially little black moles, "beauty spots," dotted about the body. These people are as a rule mildly but definitely undersexed, and tend to become obese on and below the waist line. But it is not any of these things which brings them for advice. They come under our notice for indefinable departures from health—headaches, asthenia, lethargy, and the various symptoms which are classified as neurasthenia. They are fortunate if they escape the stuffing of the Strasbourg goose type and the spanking of the anecdotal and too familiar masseuse. In any case they will obtain no real relief until someone recognizes in them the stigmata of their pituitary debauch. Into the various causes of the preliminary pituitary excess it is not possible to enter here. I have already referred to the most important—namely, toxæmia, which is nearly always of intestinal origin, and I shall attempt to show presently that its correction is purely a matter of rational dietetics.

The interrelationship between all the glands of the endocrine system, which it is always so necessary to bear in mind, is nowhere better exemplified than in the association which they all seem to have with the organs of generation—the gonads, as they are conveniently called. Both in the male and in the female the gonads have been shown to have very intimate relationships with the thyroid, the pituitary, the suprarenals, the thymus, and the pineal. Indeed, when one comes to consider each gland separately, its importance, its alliances and ramifications, one is inclined to claim for each in turn the title of leader of the orchestra which I have applied to the thyroid. One is reminded of those detective stories in which the reader is led to believe that each character in turn is surely the real culprit. In the play of the endocrines I am as a rule firmly convinced that the thyroid is the "star turn," but whenever I contemplate the responsibilities of the gonads, this conviction weakens. The ancients who worshipped the phallus as the origin of life were animated by a sound if savage instinct; for latter-day science has taught us that the secretions of the testes come very near to fulfilling that claim.

The researches of Voronoff in testicular grafting,² which I have followed with the closest interest,³ prove to my mind quite conclusively that the internal secretion of the male gonad can accomplish miracles beside which those achieved by thyroid extract in myxoedema pale into insignificance. It has been the fate of most of us to meet with completely negative results from the administration of testicular and ovarian extracts by the mouth, and some people have been moved by these failures to push the negation to the point of denying to the gonads in both sexes any really active internal secretion. Voronoff's researches have taught us this clinically important fact: that though quite inert when administered orally, presumably from destruction of the hormones in the intestinal tract, the internal secretion of the male gonads is extraordinarily active when applied in the form of grafts. These grafts must, however, be applied scientifically to situations in the human body where experience has shown they may be expected to survive.

And when they do survive, their beneficial effects are exercised by no means exclusively, nor even predominantly, upon the sexual capacity, but are displayed to an even greater extent in the muscular and mental and even arterial rejuvenescence of the patient. This chapter in endocrinology is only just opening, but when Voronoff's work has been freed from the salacious wrappings in which the lay press has so far concealed its scientific value, the activities and potentialities of the testicular hormone will go far to justify the primitive adulation lavished by the ancients upon the phallic emblem. The testicular hormone effects rejuvenation and prolongs life. There is here no question of putting new wine into old bottles, because Voronoff's results strongly suggest that the bottles themselves—the blood vessels—partake in the general rejuvenation, and he believes that the application of his methods will eventually result in prolonging the ordinary span of life to 100 or 120 years.

II.

An inquiry as to why it is that man so conspicuously fails to attain to anything reasonably approaching such an age as 120 brings me to the second item on my programme—the question of vitamins.

There is an old and ugly saying that man digs his grave with his teeth—a very general recognition of the truth of which has impelled medical men for over a hundred years to dabble in the question of diet. Until recently the researches were directed to the discovery of substances in the dietary of civilized man which were responsible for the obviously detrimental effects upon his health. Haig indicted uric acid; Hare accused carbohydrates; other persons have arraigned other substances. The discovery of the vitamins has completely changed all this. It has shown that the real villain in the piece was not an intruder, but an absentee. Food is now seen to be harmful, not from what it embodies, but from what it lacks, and research workers are diligently dissecting the absentee so as to show us his component parts. Now I have no word to say against these researches, still less against the researchers. Nevertheless, I claim that this work, so far as we are concerned for the moment, is purely academic, and that attempts to utilize it in practice are liable to produce a false perspective. Our knowledge of these elusive vitamins is still very meagre. For a long time we admitted three only, as generally necessary to salvation; recently a fourth has been added, and it is as certain as anything can be that there are more to come. For the present, then, we must treat them as a whole, just as we should try and treat endocrines as a whole; for their various members are probably just as interdependent as the various ductless glands. To individualize them, as is now being done, is academically interesting no doubt; but it is dangerous. It is at least possible, it is even very probable, that they only attain to their maximum effect in the presence of one another; that there is in fact a vitamin balance which is just as important to the economy as an endocrine balance. We must therefore so frame our dietaries as to secure the inclusion not only of those already labelled, but also of those which still await isolation. In order to do this we must go back to first principles and ask ourselves what these vitamins really are. The answer is that vitamins are substances which are essential to growth, development, and the maintenance of health, which exist abundantly in raw foods and are relatively absent from cooked foods.

It has been the unfortunate fashion among some of the research workers to try and estimate the minimum amount of each known vitamin which will satisfy the demands of the economy. Now, what we want to arrive at is not the minimum, but the optimum, and I think the optimum in this case will ultimately be found very nearly to coincide with the maximum. Let me remind you that man is the only animal which is unable intuitively to select suitable food. It is obvious that he must at one time have possessed that power, and equally obvious that he lost it through the cooking stove. Whether or not Charles Lamb's *jeu d'esprit* concerning the origin of roast pork represents the real beginnings of cookery I cannot say. In any case it is certain that cookery is an art which, gaining on us gradually through the ages, has long since reached the point of overwhelming us. It is no longer our servant; it is now our tyrannical master. We think and speak and act as though all foods ought to be, must be, and shall be cooked. Cookery has permeated every class in the community, not only as a

practice, but as an article of faith, and has unfortunately succeeded in dragging the medical profession at the tail of its triumphal car. Now if we are to profit by the advent of the vitamins we must modify this attitude, rearrange our outlook, and abjure this molten image. Cooked foods must be placed in the same category with alcoholic drinks—that is, they must be classed as luxuries, moderate indulgence in which is not only permissible, but often even praiseworthy.

Our real foods, that is the foods which are proper to us, are those with which Nature has provided us—namely, raw foods, dairy produce, and uncooked fruits and uncooked vegetables. These should constitute the foundations of our dietetic edifice, our altar, on which the individual may offer up any burnt sacrifice of sheep and oxen, birds and little fishes, which fashion or taste may direct. Up to the present it has been our practice, and for many of us it will remain so until we die, incontinently to forbid our patients to eat raw foods in any form, with the result that we are just as far from the successful treatment of certain general or diathetic diseases, such as gout, rheumatism, and other forms of arthritis, as we have ever been. These maladies rank high amongst the so-called deficiency diseases—diseases, that is, which are directly due to an inadequate supply of vitamins to the economy. Nor do they by any means rank alone. I have satisfied others, and more than satisfied myself, that most of the troubles of the endocrine system are due to a similar deficiency and that hormone medication seldom or never produces its best results unless it is accompanied by an abundant supply of vitaminous foods.

It may be said that vitamins are to the endocrines what the endocrines are to the economy. But it is by no means in the relatively recondite department of endocrinology that you may confidently expect to reap rewards from insisting upon a plentiful supply of vitamins. In this direction the daily round, the common task, will furnish all you need to ask. Let me give two examples.

Arbuthnot Lane has rightly attributed all manner of minor maladies, to say nothing of major, to chronic intestinal stasis. Now anyone who is afflicted with this almost universal disability may very easily convince himself that simple stasis is due directly to vitamin deficiency. I could quote several cases of people who for years—in one case it was as many as thirty years—had never dared to go to bed without taking 2 grains of cascara or its equivalent, since taking to what may be called an intensive vitamin dietary, succeed daily, regularly, and royally in relieving their bowels without any assistance whatever. And there is another feature in this situation, which is supplied by the fact that although such a person never is constipated, he is above all others the one who can afford to be, for stasis in his case does not mean the lethal process of putrefaction; it means the benign function of fermentation. The *Bacillus coli* is like ourselves, he changes his character according to his diet. When stuffed with devitalized flesh foods he becomes quarrelsome and poisons his host, but when fed on live carbohydrates which are enabled by a rational dietary to reach him in an insoluble envelope of cellulose, he becomes lamblike and assists his host in disposing of enemies. The rational outcome, then, of Arbuthnot Lane's teaching is not so much laparotomy as rational dietetics. If the latter is followed out, the former becomes unnecessary.

My other instance refers to the fierce and fantastic fashion of the wholesale extraction of teeth whenever the gums are found to be disordered. The word "pyorrhoea" has become the plaything of the profession and the bane of the public. It ought to be neither, and will not be as soon as it is generally recognized that pyorrhoea is secondary to intestinal stasis, and that intestinal stasis, when it is not structural, is permanently curable by a vitaminous dietary. Several people, mostly youngish women with seemingly good teeth, have come to me asking what they might do to be saved from the dental forceps with which they had been threatened, and all of those who consented to play the dietetic part of Nebuchadnezzar are still wearing the denture with which Nature provided them, surrounded and supported by perfectly healthy gums. Whether the vitamins have any directly beneficial effect upon the gums themselves I cannot say; but I should think it highly probable. They are certainly very powerful in preventing the deposit of tartar.

III.

There are many subtleties of a biological nature which I would have liked to touch upon, such as climate and environment generally, and their influence upon the physical make-up of individuals and races. But I must confine myself to one or two questions, fraught with difficulties and subtleties, which are forcing themselves upon our attention with ever-increasing insistence.

Of psychology we have heard a great deal during the last ten years. Much of what we have heard has been very illuminating and very helpful, but a great deal of it appears to some of us to be the purest balderdash. In an honest endeavour to sift the wheat from the chaff I have been struck with the responsibilities which have been fastened upon the unconscious or subconscious mind. At first I was inclined to think that the subconscious was a pure assumption, a convenient but rather desperate endeavour to explain the otherwise inexplicable. I have, however, been able to convince myself that the unconscious has a real existence, and that it is therefore legitimate to speculate upon its workings. And not only has it a real existence, but a definite and anatomical local habitation. To appreciate this fact we must once more return to first principles.

On looking back through the ages it is not difficult to realize that mind must have existed in the scale of evolution not only before man was moulded, but even before the vertebrates emerged. The ganglion cells which constituted the nervous system of the invertebrates were the ancestors of our autonomous or sympathetic nervous system. These ganglion cells were the organs of a mind, a very primitive and rudimentary mind no doubt, but quite adequate and effective so far as the needs of its possessor were concerned. The function of these ganglion cells was to control breathing, circulation, feeding, excretion, and reproduction, and the ganglion cells of our sympathetic nervous system are their lineal descendants, performing the same functions for us as the original ganglia performed for our invertebrate ancestors. Now, closely associated with these original ganglia, and practically coeval with them in the scale of evolution, are the endocrine glands. The system thus evolved was the organ of a mind. It received an impression and responded thereto by an act, which, by constant repetition became customary or automatic. If, for example, you inadvertently touch an object which is very hot, you remove your hand with great rapidity, long before the sense of undue heat has reached your consciousness. You perform, in fact, a reflex. The whole of our purely animal physiological life is dominated by these reflexes, situated in the sympathetic or vegetative system. The workings of our viscera, which normally never reach our unconsciousness, are the most orderly and best disciplined things we possess. It is therefore obvious that they must be under the guidance and control of something which for want of a better term we are compelled to call a mind.

Now this unconscious mind is not only automatic, it is also constructive. Arbuthnot Lane has shown us how, in order to counteract undue mechanical strain in the adult skeleton, supporting bands of considerable ingenuity in design and complexity in structure are developed. Their manufacture is quite unconscious, but no one who has studied them could for one moment doubt that they are the result of thought. They are not haphazard; they are beautiful illustrations of the laws of mechanics. Moreover, if there be no such thing as an unconscious mind, how are we to explain the hypertrophy of organs in response to a special demand? How else are we to explain the phenomena of intuition, the process by which people, chiefly women, arrive at a correct conclusion by a jump, as it were? Such a person will tell you that she knows; she cannot tell you how she knows; she says she just knows. And, the devil of it, she does know! The reason is, of course, that the primitive, the visceral, the autonomous or unconscious mind gives information to the conscious, but like a wise judge it announces its conclusions but withholds its reasons. I feel that I must in passing emphasize the fact that our vegetative nervous system, this organ of our unconscious mind, includes practically the whole endocrine system. The ganglia of the sympathetic have the closest possible rela-

tionship with the suprarenals and, through these, with each and all the ductless glands.

Now, I am no psychologist, still less am I a psycho-analyst, but events during and since the war have brought home to me the fact that ordinary physicians cannot afford to neglect the operations of the unconscious mind. In my young days our elders spoke gravely of the influence of mind over matter. They did not know what they meant, and our intolerant youthful scepticism convinced us that the words meant nothing at all. Nevertheless, they do mean a great deal, and they are rapidly coming to occupy an honourable place in the domain of therapeutics.

When M. Coué came to London I went to hear him, and subsequently read the book by M. Baudouin which sets forth the principles of the New Nancy School, of which M. Coué is the originator. To the experienced psychotherapist there is nothing new in this teaching, but to the ordinary physician there is. Or rather should I say that the ordinary physician will find in this teaching the orderly presentation of many facts and considerations of which he was previously cognizant, but so vaguely cognizant as to render his knowledge useless.

We are rapidly passing out of the sector of drug therapeutics in which most of us were brought up, and are being forced to take our bearings in fresh areas. Among these the area of rational psychology is by no means to be neglected. We know something about the anatomy of the unconscious mind; let us study its physiology. Suggestion is a strong living force, and auto-suggestion an even stronger. These forces should not be left to quacks and charlatans to play with. They should be studied, harnessed, and exercised by responsible medical men as a part of the ordinary therapeutic armamentarium. No one has a better opportunity than the general practitioner of utilizing these forces for the public benefit, because no one finds his patients in a more receptive or suggestible condition. Rational psychology should no more belong exclusively to the psychologist than digitalis should be the monopoly of the cardiologist.

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AN OPERATION FOR ATROPHIC RHINITIS (OZAENA).

(Preliminary Note.)

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THE pathogeny of atrophic rhinitis is still a matter of dispute; this is due possibly to want of attention to classification of cases and need not now be discussed. What is not in dispute is that, apart from epithelial metaplasia, undue width of nostril—that is, of the whole nasal passage from vestibule to choana, whether this width be primary or secondary—is an important factor in stagnation, drying, putrefaction, and fetor of the nasal secretion. Where the disease is unilateral it is in the wider nostril, or worse in it.

To prevent the formation of the stinking crusts characteristic of the disease various operative measures have been devised. Submucous injection of paraffin sometimes succeeds in narrowing the nasal passages sufficiently to enable the patient to cleanse his nose by blowing and so lessens crusting and fetor. But frequently, and especially in extreme cases, the mucosa will not hold much paraffin, even though the paraffin injection is preceded by one of anaesthetic fluid so as to create a pocket; the paraffin perforates the membrane when more than a little has been injected. Moure tries to meet this by prior vibratory massage of the mucosa for months so as to revivify it. In my hands the paraffin method has been on the whole disappointing. Translation of the inner antral wall toward the septum (Halle) seems rather a formidable measure, hardly likely to be generally adopted.

While paraffin may continue to be used for the less