cerebri; further mechanical, chemical, or toxic irritants can act in the same manner.

Some factors precipitate convulsions—as, for instance, pressure on the carotids, blows on the skull, lumbar insufflation of air, and sometimes lumbar puncture; also sensory irritants, such as pressure on peripheral scars, operative irritants, worms, and affects, especially shock with angiospastic effects.

The liability of the brain to convulsions is augmented by certain secretions. Of these the secretions of the suprarenal gland, of persistent thymus, of the corpus luteum, perhaps even the epiphysis cerebri, increase excitability; on the other hand, the parathyroid glands, the sexual glands, the pituitary, and perhaps the pancreas decrease the tendency to convulsion. The thyroid gland is ambivalent. It is probable that the glands influence the proportion of potassium ions and calcium ions.

It is important that in epilepsy we can also show in the blood serum the “decomposition” of internal secreting glands, especially the thyroid gland, also to some extent the sexual gland and also the suprarenal gland. These reactions are generally less intensive than in schizophrenia, but they are often important in the differential diagnosis from hysteria.

I would mention that the removal of a suprarenal gland by operation has absolutely no effect on recovery. However, many factors can predispose the brain to convulsions; different irritants, among these also auto-toxaemia, can prepare the latent convulsion until finally the convulsion appears by summation or by the addition of a new irritant.

The influence of the liver in mental disorder is still somewhat uncertain. Most probably it is a factor in Wilson's disease—progressive lenticular degeneration. The tissue of these centres in the brain is disintegrated with formation of granular cells, but the process also occurs in the cortex cerebri. According to Alzheimer the giant glial cells may sometimes be found; further, a nodular cirrhosis of the liver is present. According to Hall there is an innate inferiority of the liver and the brain. The differential diagnosis as compared with other diseases of the extra-pyramidal system is not exact.

Kirschbaum examined the central nervous system in three cases of acute yellow atrophy of the liver, and found degeneration in the corpus striatum and in the pallidum, and also in the cortex cerebri. In experiments on animals in our clinic he also found that with elimination of the liver no serious damage in the corpus striatum and in the pallidum occurred.

Formerly great importance was attached to bodily exhaustion as an initial cause of mental disease. A number of disorders were classified as exhaustion psychoses, such as amnesia and inanition delirium. Cases of shipwrecked persons, exposed for a long period to hunger, were described as being delirious. But here probably also psychical causes were at work, principally fear and desperation. Sometimes a mental disorder could be observed as early as the second day.

In speaking of exhaustion we must distinguish between bodily exhaustion (fatigue) and lack of sleep and lack of nourishment. Bodily strain has a more harmful effect on the heart than on the nervous system. Lack of sleep can, of course, cause disorders in a normal mind. Proportionally small is the influence of hunger. I have made experiments myself and established that three days without nourishment caused only a very slight lapse of memory and of the association of ideas, whereas perception is well preserved. On the other hand the mental qualities declined very quickly during a sleepless night.

Also the brain of animals killed by hunger experiments is much less affected than the brain of those dying from lack of sleep. The war furnished a gigantic experiment in respect of exhaustion; also of opportunities of observing the influence of hunger on insane persons, but the result was negative. A paranoid woman, five and a half feet in height, decreased in weight by as much as 24 kg., or 53 lb., without any alteration in the mental condition. Thus exhaustion only has a very slight influence in causation of insanity, and least of all lack of food.

Our summary shows that in psychoses an extraordinary

quantity of biological and chemical changes occur which can be explained by auto-toxaemia. In part these are secondary symptoms of illness due to other causes, as in the case of general paralysis.

In part, however, these disorders must be attributed to causal factors. The cause of a psychosis is not so simple as a chemical reaction. In general, it is a question of a collection of factors. Primarily an innate disposition, especially both in the central nervous system as well as in the vegetative nervous system and in the system of endocrine glands. This is so in cases of idiocy and feeble-mindedness with disorder of the glands, as well as largely in dementia praecox; but if these conditions are present they are often succeeded by external and internal irritants as in epilepsy.

An important question is, Can the treatment utilize this point of view? In some ways this has already been done. Most successful are cases of myxoedema and cretinism. These diseases will soon disappear altogether; but in this the prophylaxis of endemic cretinism will contribute by the purification of water and the application of small quantities of iodine.

Results are possible in pituitary disorder by treatment with x rays, and more by radium and by operation, but sometimes also in diminished function of the glandular part by the administration of organic substances, such as fresh animal glands, prepared glands, or glandular extracts. A number of other “organic” treatments are more important in neurological cases than in psychiatry. Also opportunity of treatment is offered in cases of epilepsy.

Unfortunately the fever treatment with malaria and relapsing fever, which we also employed in our clinic in cases of dementia praecox, epilepsy, multiple sclerosis, etc., has not as yet had positive successes. Also other treatments of dementia praecox with organic substances and blood transfusion yielded no result.

To be sure Wolfgang and von Wieser of Vienna report successes in disorders of the internal secretion by x-ray treatment. First, the ferment reactions of Abderhalden and the basal metabolism must be specified, whereupon irradiation of the endocrine glands with x rays follows. Wieser has already treated 98 cases of idiocy, including Mongolism, and in 94 cases the clinical condition and the quality of serum were improved. Besides these numerous other disorders of psychical, neurological, and endocrine character were treated. The reports thereon are certainly worth following up.

Both diagnosis as well as therapeutics demand that the research of the auto-toxaemic influences in psychoses is to be regarded as one of the most important tasks in psychiatry.

VISUAL EFFICIENCY AND WORKING ABILITY.*

BY

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It would perhaps have been more in consonance with the subject and with the contents of the following contribution had the title of the discussion been “Visual inefficiency and working ability,” for the burden of my story is that much work can be done by persons who suffer from very defective eyesight.

Advancing years, if they have not brought wisdom, have perhaps brought a certain amount of caution. At any rate, I had much rather sit and listen to people nowadays than air my own opinions; still, I think I am not wrong in saying that the origin of this discussion was a communication which I read to the Royal Philosophical Society of Glasgow on October 19th, 1927. In that communication I advanced my reasons for holding that for most forms of manual work visual acuteness, in the strict sense of the term, is scarcely required at all. That paper, by the courtesy of the late Sir Dawson Williams, whose death I much deplore, for I knew him intimately for forty years,

* Read in opening a discussion in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, Cardiff, 1928.

was published in the *British Medical Journal* of January 14th, 1928 (p. 42).

Our textbooks have a good deal to say about foveal, or perhaps I should say macular, vision; that form of vision which I shall hereafter call visual acuteness, and by which ordinary types used in printing are recognized, and reading and writing made possible. This function of visual acuteness is specially prominent in one part of the field of vision, and I incline to restrict the term visual acuteness—Dor's diagram notwithstanding—to macular vision. The field of visual acuteness has not yet been accurately measured. I have made some attempts to measure it by two different methods, but there are many sources of fallacy, and results can only be taken as approximately correct. It may, with tolerable certainty, be said that the field of visual acuteness, or if you like the phrase better, macular vision, does not exceed two degrees in the total field of vision. So far as my observations go it is not circular or oval, but rather larger from side to side, than from above downwards. A recent experiment may here be noted. I found that at a distance of 120 inches from a set of Snellen's ordinary test types I could not distinguish even the large H at the top of the scale at a greater angular aperture than eight or ten degrees. By that I mean that the line between the H and the nodal point of my eye made with the line between the point of fixation and the nodal point an angle of eight or ten degrees. With a greater angular aperture I could see the black and white, but could not have told that it was the letter H. People, if they like, are entitled to call that visual acuteness, but it is widely different from the special function of macular vision. With enormously greater angular aperture I could still see objects in the room quite distinctly, and could have avoided them had I been in motion. The binocular field of vision in the horizontal meridian extends to about 184 degrees; to use nautical language, it extends from about 2 degrees abaft the starboard beam right round to about 2 degrees abaft the port beam, and in the whole of that excursion the macular vision, if any point in the arc be made a point of fixation, is not greater than two degrees in emmetropia.

In myopia, say of four dioptries, the far point of macular vision is approximately at ten inches, or twenty-five centimetres; beyond that there is practically no field of visual acuteness for such an eye, in the strict sense of the term. Now I have again and again recorded cases of persons with very high myopia who suffered no inconvenience therefrom in their work. Thus I have on several occasions given accurate details of colliers with high amounts of myopia, who had no difficulty in making as much money as the best sighted collier could, and what is true of coal-mining is true of almost every other form of manual work. To return once more, and briefly, to the field of vision; outside of the macular field objects can be seen almost to the extreme of the peripheral field. The details, no doubt, cannot be made out, but if the eye be healthy, objects are not only distinguished, but it is possible to estimate their positions relatively to each other. One essential in the peripheral location of objects is the sense of projection, and another very important feature is the subconscious estimation of distance. The first no doubt depends upon such factors as the light sense and the colour sense. Objects in nature stimulate the parts of the retina on which their images are formed differently, according to their luminosity and their inherent colour, or lack of colour, and their shape. I have always felt that the light sense is not nearly so much studied as it should be, and in modern times that neglect is all the more unjustifiable, for we have now many good photometers which are of easy application. In macular vision the intuitive estimation of distance, or what I may, without raising an argument, call the subconscious estimation of distance, is a very important factor; to a considerable extent it supplies the place of stereoscopic vision. One of the best artists that we had in Glasgow during the last half century was a gentleman who all his life enjoyed the use of only one eye, the other from his early childhood being quite blind, and yet so far as perspective was concerned his pictures did not show any defects. He was a draughtsman of the first order, and his drawing was always correct. The

factors that determine the subconscious estimation of distance are very numerous. Here I can only mention a few. In binocular vision the most important is the function of convergence—the nearer the object is the greater the amount of convergence required. That important factor, however, is not available to persons who have only one eye, like my artist friend. There are at least three factors which in these circumstances come to be of service—namely, the size of the retinal image; the amount of accommodation used for fixation; parallax. A very important factor is the subconscious mental checking of the physical data. Where a person is seen at a great distance along a highway the retinal image is much smaller than if the same man were seen near at hand. The observer knows quite well that the height is the same and that the man, as he approaches, has not for some obscure reason become larger. On somewhat similar lines the distance of objects is to a considerable extent determined by the comparison of the object under observation with other objects in the same neighbourhood whose sizes are approximately known to the observer; that is a matter of education, or at any rate of experience in life.

Another very important feature in the estimation of distances, and in determining the relative position of objects, is parallax. If there are two objects and one is seen to move in front of the other, then it is obvious that the object which so moves is nearer than the other. Similarly, when an observer changes his position he may see an apparent movement in the objects surrounding him.

When binocular vision is absent, and when there is no impulse of convergence, then to a very considerable extent its place is supplied by the following factors: differences in light and shade and probably in colour tone; apparent size of objects and the intuitive comparison with objects the sizes of which are approximately known.

To my way of thinking—I speak with deference in the presence of so many colleagues whom I regard as more authoritative than myself—the macula has both visual acuteness in the restricted sense in which I use that term, and field vision. The special function of macular vision seems never to be called in except as a volitional act. As a man walks along a street the images of various objects, such as signboards and posters and other things, are formed on the maculae, yet he never appears to see them except volitionally. A person may stand before a large bookcase filled with books; the images of some of the titles must be formed on his maculae, and yet that fact does not give rise to consciousness; it is only when he begins by a volitional act to examine the labels that he becomes acquainted with the contents of the case.

The sense of projection, or, in other words, the power of locating various objects in their proper positions, is alike common to binocular and to monocular vision. To illustrate that point, I put two coins on a table, one immediately in front of me and the other considerably to the side, and with both eyes open I look steadily at the one immediately before me; while doing so I have no difficulty whatever in striking the other one with my hand, or, if the distance be too great for my arm to reach, with a stick held in the hand. If the experiment be repeated with one eye shut it is not found more difficult to strike the coin which is peripherally situated.

Now to give a few practical examples in confirmation of the preceding remarks. The first condition to which I shall call attention is the one already mentioned—namely, myopia. A man with ten dioptries of myopia does not require to bring his eyes to four inches from a tramcar before he sees it, nor does he require to put his eyes to four inches from the step of the vehicle before he mounts into it. His peripheral vision enables him to distinguish the car and to get into it, if he so desire, like any ordinary mortal. His peripheral vision enables him to walk along a street without jostling his fellow men. He can tell the colour of a car at a considerable distance, and for the most part can also tell the colour of a light. It is only when he comes to read such things as the names of streets or the direction boards on cars that he fails. I have elsewhere mentioned the case of a man who is blind of one eye and who has several dioptries of myopia in the remaining eye, and who yet has driven his own motor car

for many years without coming into collision with any object; so also a person with a moderate amount of myopia can make out land or other ships nearly as well as an emmetrope. In the communication which I made to the Royal Philosophical Society in Glasgow I narrated that when I made my eyes artificially myopic by putting a spherical +3 in front of my correction I could, on a night when there was no moon, but starlight, quite well make out islands eight miles away from the place where I was standing. On the other hand, in daylight, in the same circumstances, that is, with an artificial myopia, of approximately three dioptries, I could not see a rowing-boat at a distance of a mile. There is, however, an important factor to be taken into consideration, and it is that the interpretation of retinal images probably differs very much in those who have made themselves artificially myopic from what it does in the case of persons who, having been myopic from their earliest days, have been interpreting defective images formed on the retina all their lives. Interpretation is not a physical process, it is mental. It is the mental process by which the individual interprets the effects of physical stimuli. No mechanistic theory is at all adequate to explain the facts of vision sufficiently. The mind determines the function, rather than the function the mind.

Here I may mention another very important group of cases, well typified by one of my friends who is very amblyopic in one eye, for in early life he suffered from concomitant convergent squint. He is a medical practitioner and is a great deal in his motor car. He drives about his district without any trouble, notwithstanding his amblyopia and the high degree of refraction error which he has in each eye. No railway company would for a moment employ this man, yet he has no difficulty in driving his motor car, and none, so far as sight is concerned, in his work as a general practitioner. One question has often occurred to me in connexion with squint amblyopia—namely, is the periphery of the squinting eye available for stereoscopic vision? If the angle of squint is a constant and the image of a distant object is focused on the macula of the non-squinting eye, then the image of the object will always be focused on the same point of the squinting eye; and so for every other point of space. Does this, then, supply the convergence factor in the subconscious estimation of distance? I hardly think that it does, for about 1906 I called attention to the value of plastograms in the detection of amblyopia of one eye. When the coloured objects are viewed through the coloured glasses, and the observer's head is moved slowly from side to side, the objects in view are seen also to move if neither eye suffers from amblyopia; but there is no movement if one is amblyopic. Now I have found that a squinter with any considerable amount of amblyopia never sees any movement. In such cases the convergence element apparently must be eliminated, and yet there are many persons with only one good eye engaged in all the ordinary occupations of life, much to the benefit of themselves and of the country. For some years back I have been noting cases of defective sight and the work which some defective sighted men can accomplish.

Another matter has claimed my attention—namely, the fact that many men who have sufficient sight for their work are thrown out of employment because someone has discovered a trivial defect which has not interfered with the person's working power, but which has caused the insurance companies to refuse to accept any risk, no matter how slight. Many persons are said to be on the dole because of laziness, and that seems to be perfectly true, but a number of people, by no means loafers, are on the dole because they have some trifling defect, very often of little moment, which the insurance companies regard as a risk that they will not accept. To a considerable extent the dole is the necessary corollary of the Workmen's Compensation Act. A man may be quite able to work, and may be more than willing to work, and yet for some trivial condition be prevented from doing so by this Act. The time is not far distant when, before an employer allows a man to enter his service, he will require to be thoroughly examined, and if any defect is found he will be rejected. It is difficult, but probably not impossible, to devise some scheme

by which a man, if found defective, might be employed without the employer running any risk, at any rate on account of accident due to that defect. The more obstacles that are placed between an employer and a workman, the greater will be the number of men kept out of work, eking out in dire poverty what might have been a useful and comfortable life.

Under the auspices of the Corporation of Glasgow, some years ago I inspected a large number of blind persons as to the causation of their blindness' and in addition to that I took careful note of the occupations of each person seen. A good number of them, although defective in sight, were able for a fair amount of work. I came across two cases of persons who were almost blind, and still able to get about the streets of Glasgow and do their work as stair lamp-lighters. Nobody at present would think of starting a man with defective sight in any such employment. One of the two told me that he was giving up his work because the motor traffic in Glasgow made the streets very dangerous for him. He had less difficulty at night than in broad daylight, because he could distinguish lights much more easily than he could distinguish objects.

Perhaps I cannot conclude this somewhat discursive paper better than by giving a few more instances of persons afflicted with defective sight and still doing a great amount of work:

J. A., aged 27, seen at the Blind Clinic. This patient has fully 20 dioptries of myopia, yet he was enlisted for the war, and actually served abroad. He was, after his discharge from the army, engaged as a coal trimmer in a steamer, and worked as such for some years. Now, with 20 dioptries of myopia, the far point is about two inches from his eyes; notwithstanding that fact he found no difficulty in shovelling coal.

J. B. Lost the left eye during the war; when seen his right eye was found to be highly myopic, and yet for years he was engaged as an iron caulker in a shipyard.

P. D., aged 51. In this case the left eye was enucleated when the patient was a few months old. In the right eye the vision is 1/36; this is one of the cases to which I already referred. He has been working as a stair lamp-lighter for a considerable number of years, and is still constantly engaged in that occupation.

J. C., aged 36. When she was a young girl I operated on both eyes of this patient for congenital cataract. She has first-rate field vision, but although each pupil is thoroughly clear and good, and the fundus of each eye is healthy, she does not possess that function to which I gave the name of visual acuteness.

J. P., aged 25. Employed by Glasgow and West of Scotland Mission to Outdoor Blind. The left eye has been enucleated. In the right eye he has a certain degree of microphthalmos with nystagmus, almost certainly congenital. At the time of the examination he was wearing sph. -13 D., but with that lens he did not admit 5/60. Without any glass he is able to read J.6 at about one inch from his eye. On dilating the pupil of the remaining eye, the lens is found to be slightly dislocated, yet he says that he is able to walk about quite freely and is even able to cycle. He does not, in moving about, require the assistance of a guide.

H. O. R., aged 43. Has worked as a miner since he was 12 years of age, and has had no difficulty in making good pay. There are about 15 dioptries of myopia in each eye complicated with three dioptries of astigmatism. Each eye showed pathological changes, yet this man was able to work quite successfully till he was attacked by miners' nystagmus.

F. S., aged 60. Left eye is, as a result of injury received twenty years ago, completely blind. Notwithstanding his monocular condition he has worked with a circular saw for twenty years.

W. S., age not noted. Left eye is divergent and is nearly blind. This condition has been present for many years, but he was able to earn his living by pumping air into a diving bell for several years. In coming from Greenock to Glasgow he did not require the services of a guide. He was put out of work because his employers, or their insurance company, were afraid of accident on account of defective vision.

G. F. Age not noted, but an elderly man. Incipient cataract in each eye; vision 3/9 in each. This man is able to continue his work as a blacksmith.

G. W., aged 18. Has 5.0 dioptries of hypermetropia in each eye. He was not allowed to wear his correction in the shipyard in which he was employed, and was dismissed on account of defective eyesight, and now, in spite of efforts made to get into some form of work, he is on the unemployed list.

The cases which I have mentioned could be added to indefinitely from the large amount of clinical material which I have collected in past years. One conclusion seems to me legitimate—namely, that while Snellen's letters enable us to form an estimate, be it said only a very rough estimate, of what a man may do with visual acuteness, there is no method of estimating, even in the roughest manner, the value of field vision. Macular vision seems to me to differ so widely from field vision that I cannot regard

them as forming a continuous function. Correction of errors of refraction is essential for macular vision; within wide limits such correction is not necessary for field vision.

The questions which have been raised seem to me to be of great importance, not merely from the ophthalmic, but also from the economic point of view. The whole subject requires a much more extensive investigation than it has yet received, and I am specially glad that the gentlemen who are to follow me are very authoritative in such matters.

It may interest the meeting to know that in the eighties of last century I wrote a note to the vice-chairman of the Glasgow School Board to urge that the eyes of all the children under the care of the board should be carefully tested. He replied that neither he nor his colleagues saw any necessity for any such step being taken. Now for centuries before eye-testing became an accurate process many people did a great deal of fine work, and no doubt in these days there was the usual proportion of emmetropic, hypermetropic, myopic, and astigmatic people.

Refractive errors must be carefully corrected for work requiring visual acuteness, but to a great extent such correction is not necessary for field vision. I had no correction till I was five-and-twenty and had possessed myself of a medical degree. I well remember the intense misery of all efforts of reading and writing, for such efforts always brought on frontal headache, and that severely. Field vision, however, caused me no trouble, even although my errors were considerable—namely, in each eye a hypermetropic astigmatism of 1.5 dioptries against the rule and a hypermetropic spherical element as well.

We owe the tests for visual acuteness now in use to Professor Snellen of Utrecht. His tests are all but universally used in all countries, and thus a standard has been fixed which is both convenient and reliable, although, of course, not absolute. Snellen's types, as we all know, consist of ordinary alphabetical letters varying in size with the distance at which they should be read by the normal healthy eye, each letter subtending for the distance at which it should be read an angle of five minutes.

A considerable number of years ago Landolt substituted his broken ring test for letters. It is perhaps a more severe test than that devised by Snellen, and is one on which those who use it place great reliance. The circles in Landolt's rings are also based on the five-minute calculation, but unfortunately, as originally published by Landolt, there is only one ring for each size. That this is not altogether suitable is obvious. It may happen that the opening in the ring corresponds with a meridian that is approximately emmetropic and thus indicate a better visual acuteness than the eye really has. It is quite possible to have the break in the ring clearly seen although there is a good deal of astigmatism. Within recent years a set of types consisting of broken rings has been prepared for the Egyptian Government. For the most part there are several circles for each size, but the break in the ring as printed is either straight up or straight down, or directly to the right or directly to the left. In the official set of types which I possess the circles show defects if these defects involve the vertical or horizontal meridians of the cornea, but may not do so if the meridians of greatest and of least refraction are oblique and not vertical and horizontal. For these reasons I have prepared a series of rings, one of each size, but each ring is capable of being turned by a screw at the back of the apparatus round its own centre.

In testing, suppose the patient at six metres sees the break in the ring corresponding to 6/18, he is asked to look at it as it is turned and to say if the break disappears or if it is quite distinct all the way round. If its distinctness remains, then the patient should be put through the same test with the ring corresponding to 6/12. If the break is not seen at all with the circle corresponding to 6/18 then the circle corresponding to 6/24 should be used, and so on.

The head of the patient who is being examined should be held in the same position all through, for an oblique position of the head may easily give an oblique refraction, and that to the extent of masking an astigmatism.

As a means of detecting the presence or absence of an astigmatism, the rotating discs seem to me to be of considerable service, and they are also a help in detecting roughly the meridians of maximum and minimum refraction. They may even be of some use, if carefully handled in the measurement of astigmatism, but for that purpose they are not equal to the fan which we also owe to Snellen, and which is, so far as I can form an opinion, simply invaluable in the correction of an astigmatism.

A British Medical Association Lecture

ON

THE MEDICAL TREATMENT OF GASTRIC AND DUODENAL ULCERATION.

DELIVERED TO THE SOUTH-EASTERN OF IRELAND BRANCH
OF THE ASSOCIATION AT KILKENNY*

BY

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BEFORE considering the medical treatment of gastric and duodenal ulceration as it is practised to-day it may be well to refer, first, to some of the essentials of the physiology of the stomach, and, secondly, to the little that is known of the causation of ulcer.

The mucous membrane of the stomach secretes a juice which contains two substances of importance—pepsin and hydrochloric acid. Pepsin is an enzyme which, acting only in an acid medium, digests proteins. In this respect it is important, but its action is not essential to adequate digestion of food, as digestion of proteins is effected in the intestine by the action of trypsin. The main action of hydrochloric acid is bactericidal, but it also activates the pepsin, and is necessary for the production of secretin. It is present ordinarily in strength of from 0.1 to 0.2 per cent. of the secretion, rarely exceeding the latter figure. In normal circumstances gastric juice is secreted when the appetite for food is roused, during the act of eating, and for a little time afterwards. During fasting, however, secretion is almost at a standstill, and the juice becomes nearly neutral in reaction. During digestion, according to MacLean, as the production of hydrochloric acid diminishes there is more and more secretion of neutral chlorides. It cannot be too strongly impressed on the mind that in no concentration of hydrochloric acid which has ever been observed in the stomach has it any digestive action. This is not to say that it may not have an irritative action on an unprotected surface. In health a small meal is completely out of the stomach in two hours, a large one in five or six.

CAUSATION OF ULCERS.

When we come to consider what is known or thought of the origin of ulcer we find little certainty. It is not my intention to recount the various theories that have been put forward from time to time; but there is no doubt that if a portion of the mucous membrane of the stomach, or of the duodenum close to the stomach, loses its self-protective power against the gastric juice it will be digested. All of us who have made *post-mortem* examinations some hours after death are familiar with the considerable degree of digestion which has taken place. Not only is the mucous membrane digested, but not infrequently the muscle is also attacked, so that the contents of the stomach may be set free into the abdomen. In this case, soon after death the epithelium has lost its self-protective power, while the juice lying in the stomach has still peptic action, adequate to produce digestion of some of the tissues of the stomach. If we assume that, from some unknown cause during life—and the cause is unknown—a limited area of epithelium loses its protective power against pepsin, then ulceration of that area is likely to occur. It is noteworthy

* A few introductory paragraphs sketching the development of the treatment of gastric and duodenal ulceration during the past forty years have been omitted.