Fixation to the prostate means that there is great danger of opening the urethra during removal of the growth; but providing the growth can be entirely removed, this does not contra-indicate excision. In one case I removed the posterior portion of the prostrate together with a malignant growth of the rectum, and the urethral wound closed quite readily in the course of about ten days, and the patient has remained free from recurrence for two years. Fixation to the posterior vaginal wall is of little consequence, as no serious disability results from its removal. Enlargement of the glands in the hollow of the sacrum is not a contra-indication, as the whole of these glands can be removed together with the growth, and should be so removed in all cases, whether enlarged or not.

As regards the future condition of the patient after excision, it may be said that in those cases where the sphincters are not involved, it is usually possible to restore the bowel after excision so that the patient has perfect control in the natural way. When the sphincters are involved in the growth, it is not possible to restore the bowel function, and the patient is much better off if the perineal opening is entirely closed, and the bowel allowed to act through a colostomy opening.

Surgery is now able to deal with rectal cancer satisfactorily, if the cases can be diagnosed at an early stage of the disease. The unsatisfactory results obtained in the past are in the main due not to any special malignancy of rectal growths, not to the art of surgery or those who practise it, but in the first place to the fact that patients affected with this disease do not seek medical advice soon enough, and more especially to the fact that those who first see the cases are not careful enough to make a local examination in all cases where bowel symptoms are complained of.

It cannot be too strongly urged that the treatment of rectal cancer can never really be satisfactory until doctors make it a rule to make a rectal examination at once in all cases where patients complain of bowel symptoms.

DEGENERACY.

By P. C. Smith, formerly Medical Superintendent, Middleton Hall, Middleton, St. George.

In a recent lecture on Mendelian heredity, Mr. Bateson stated that the transmission of nervous diseases does not follow the laws of heredity, as the ratio of affected to unaffected descendants is nearly always too high. This fact will not appear surprising if we consider that, in the majority of cases, these diseases are either complications or simple developments of a pre-existing condition, so that the scheme of their distribution is modified by the scheme

1 Reported in Brit. Med. Journ., London, 1906, vol. ii. p. 61.
of distribution of that condition. The condition referred to is what has been called degeneracy; a state characterised by imperfections, both of structure and of function, that, as we shall find reason to believe, are of developmental origin. To the best of my knowledge, degeneracy has not hitherto been treated in a similar way to other pathological conditions, with an account of its etiology, pathology, symptoms, complications, diagnosis, prophylaxis, and treatment. This essay is an attempt to fill that lacuna, and, further, to investigate, so far as is possible at present, the mode in which degeneracy is transmitted or distributed. As the more essential features of the morbid histology and chemistry are still unknown, the pathology and etiology are largely a matter of inference from the symptoms, and the discussion of them will be deferred till after these have been enumerated. The most marked forms of degeneracy—idiocy and imbecility—have been thoroughly dealt with in text-books and other works, so we shall not treat of them here at length, but shall merely refer to them in order to complete the picture.

**Symptoms.**—These consist of defects, structural or functional, which either are present at birth or show themselves during the period of development.

**Structural.**—Undergrowth or overgrowth or imperfect formation of one or more systems is common, and may be either local or general. Thus there is often hypoplasia of the muscles, usually affecting all, but sometimes only the calves or great pectorals or some other pair of muscles. Even when the muscles are of normal volume, they are frequently deficient in tone. This want of development or tone, coupled sometimes with laxity of ligaments, may produce spinal curvature, genu valgum, flat-foot, or hernia. Atony of the elevator muscles of the thorax will cause the upper ribs and the cervical fascia to sink, so that the attachment of the pericardium to the cervical fascia is brought nearer to its diaphragmatic attachment, and thus the pericardium, which is normally taut, becomes lax, and allows greater play of movement to the heart. Thus we have the condition of mobile heart. Connective tissue usually errs in the direction of overgrowth; this, combined with feebleness in the abdominal muscles, may lead to enteroptosis. If the liver be prolapsed, the diaphragm and heart will follow it, the latter descending into a wider part of the body where it has more room for movement; thus hyperplasia of connective tissue may be a cause of mobile heart. Imperfect development of blood vessels is shown in varicocele and varicose veins generally; these, however, are partly dependent on laxity of the supporting structures.—varicocele, for example, being accompanied by laxity of the spermatic cord and scrotum, due to want of tone in the cremaster and dartos. According to Dr. Mott, an inherent germinal de-

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1 These two cases of mobile heart were pointed out to me by Dr. C. Addison, Professor of Anatomy in the Charing Cross Hospital Medical School.
Degeneracy. 

Ficieney may play a part in degeneration of the aorta and other large vessels. Smallness of the aorta and other vessels has also been described. The skin sometimes shows undue thickness or thinness or coarseness, or liability to disease; and the hair and nails often exhibit signs of malnutrition, apart from any illness, so that they probably have some congenital defect. The cartilages and bones may be overgrown or undergrown or imperfect in some way which renders them more liable to the skeletal manifestations of rickets. Hyperplasia of lymphoid tissue is shown by the enlarged tonsils and post-nasal adenoids that occur so commonly in degenerates, and by enlargements of lymph glands also. Ligaments are often unduly lax.

These faults of development are sometimes combined to form well-known types. The "tuberculous" and the "scrofulous" types of conformation appear to be due to mal-developments occurring in degenerates; the former depending on hypoplasia of bones, muscles, and fat, with vaso-motor instability; the latter on hyperplasia of skin, connective tissue, and lymphoid tissue, with want of tone in the muscles.

There are also very many errors of development showing themselves on the surface of the body, some of them being due to imperfect closure of foetal clefts. The number of these is very great; the following is a fairly full list of those that may be present in mild cases of degeneracy.

Disproportion of size between different parts of the body, especially between the cranium and the face, and between different parts of the face. A common example of this is smallness of the lower jaw, which has ceased growing before the rest of the face, or has grown more slowly.

Irregular shape of the skull (due to premature or delayed ossification of the sutures). Flattening of the hinder part of the skull. Markedly lateral position, or doubling, of the whorl of the hair. Asymmetry of the face.

Malformations of the ears: abnormal projection from the side of the head; abnormal projection, or bifurcation, of the root of the helix; absence of the greater part of the helix; notching of the helix; the presence of a certain projection (Woolner's tip) near the upper part of the helix—this, however, was surmised by Darwin to represent the pointed apex of the ear found in other mammals; various abnormalities of the antihelix, tragus, and antitragus; absence of the lobe (this is normal in some races); adherence of the lobe to the cheek.

Malformations of the eyelids: congenital entropion, epicanthus. Malformations of the eyes and their adjuncts: too slanting a position; increased, diminished, or unequal size; coloboma; irregular shape or eccentric position of the pupils; different colour of the two irides; squint.

1 Journ. Ment. Sc., London, 1906, p. 685.
Malformations of the nose, as over-development, under-development, lateral deviations of the septum.

Malformations of the lips and mouth: mouth too large or too small; lips too short, leaving the teeth uncovered, or too long, or too thick; hare-lip; palate asymmetric, or too narrow and highly vaulted; defective development of the hard palate antero-posteriorly; non-appearance of some teeth; irregularity of the rows of teeth; increased or diminished size of the tongue; bifid uvula.

Persistent branchial clefts.

Markedly lateral position, or doubling, or even tripling, of the dimple over the sacro-coccygeal joint.

Bifidity of the spinous process of a vertebra (usually lumbar), or of more than one.

Abnormalities of the thorax, such as narrowness; also shortness of the first ribs; funnel or gutter-shaped depressions of the sternum.

Congenital hernia (and often acquired hernia indirectly—from imperfect muscular development).

Undue shortness or length of the upper or lower limbs. Disproportionate length of the forearm or leg as compared with the upper arm or thigh. Exaggeration of the divergence between the axis of the upper arm and that of the forearm—ulna vara, one might call it.

Malformations of the fingers and toes: supernumerary digits; undue shortness, most often of the little finger or the thumb; undue length (rarer— afecting usually the thumb or the great toe); webbed fingers; lateral deviation of some of the phalanges; rotation of some of the phalanges on their long axes.¹ There is another condition that I have often observed in degenerates, but which may possibly occur fairly often in others too—lateral thickening of the proximal end of the second phalanx of one or more fingers. Genu valgum, varum, and recurvatum. Talipes.

Malformations of the genital organs: abnormal largeness or smallness of the penis, torsion of the penis, hypospadias, epispadias, occlusion of the urethra, smallness of the testes, excessive development of the labia majora, supernumerary mammae, supernumerary mammae.

Hair in abnormal positions.

Feminine conformation in men, masculine conformation in women, and infantile conformation in adults.

To these abnormalities of the individual may be added one mentioned by Dr. Féré as affecting the family: great variation in height among brothers and sisters; usually the former tend to dwarfism and the latter to gigantism.

¹ Lateral deviation and rotation of the phalanges are two of the commonest malformations of degeneracy; yet the latter was not described till last year (Ch. Féré, Rev. de chir., Paris, 1896, January 10; P. C. Smith, Brit. Med. Journ., London, 1900, March 3).
It must be pointed out that a malformation, or even more than one, may be present in an individual though neither he nor his family shows any signs of degeneracy. Moreover, we sometimes even find abnormalities due to incomplete development (such as cleft palate) in several members of a non-degenerate family; I have thought—though as yet I have insufficient evidence—that in this latter case the defect, unlike those of degeneracy, is hereditary in the ordinary sense.

On the other hand, cases have been recorded of marked mental degeneracy without any anatomical stigmata. But these are rare.

Physiological.—Any of the following may occur, some being invariable, or almost so, and others comparatively rare:

Delay in walking, talking, and development generally; precocious development in some cases; eruption of the teeth premature or retarded (apart from rickets); early senility; the condition which I have described as neurasthenia minor, and Mr. Whiteing—more picturesquely—as being "born tired." I have elsewhere pointed out that the name neurasthenia is commonly given to two complaints that differ clinically—the present condition, and the affection of adults that is characterised by headache, rachialgia, insomnia, intestinal atony, and mental depression, with other symptoms (neurasthenia major). The major disorder in most cases, in this country at least, is simply an exacerbation of the minor. A full description of neurasthenia minor will be given under Psychical Symptoms.

Sensory abnormalities: want of acuity in the various senses, colour-blindness, nyctalopia, hyperesthesia or hypo-aesthesia.

Defects of the voice, such as speaking through the nose.

Defects of speech, such as stammering, lisping, the mispronunciation of certain letters, the hurried ejaculation of words.

Grimaces, twitching of muscles, and other tics. Nystagmus. Left-handedness. Incontinence of urine. Hiccup.

Vomiting in children without apparent cause or from emotional disturbance. As pointed out by Dr. Still, both this and the previous symptom arise from irregularity of action; hiccup is due to disordered movements of the diaphragm, and apparently causeless vomiting to closure of the pylorus when it should be opened.

Rumination (also due to irregular action). Inco-ordination, amounting, as a rule, to no more than clumsiness.

Disorderly emotional movements—Dr. Warner's "extra movements"—are readily aroused by excitement. With these perhaps may be grouped nervous inhibitions.

Exaggerated reflexes (in some cases).

Vasomotor abnormalities: ready blushing, attacks of giddiness or faintness, excessive perspiration, pseudo-anæmia, ex-

1 Brit. Med. Journ., London, 1903, vol. i. p. 781; and 1906, vol. i. p. 494.
aggeration of the influence of posture on the pulse rate, tendency to faint, polyuria, frequency of micturition. The pulse tension is usually low.

Dilatation of the pupils (sometimes).

Abnormalities of the genital functions: delayed puberty, abnormalities of menstruation, absence of lactation, diminution of sexual power (imperfect erectile power), sexual perversions.

Faulty nutrition. Tendency to epistaxis and other hæmorrhages (apart from hæmophilia).

Attacks of pyrexia in childhood without obvious cause. Night terrors in children. Attacks of palpitation of the heart.

Abdominal distension in children, which may give rise to a diagnosis of tabes mesenterica. Laryngismus stridulus. A paroxysmal cough in children, which resembles whooping-cough and may be taken for it; it often lasts a considerable time, sometimes even months. Cyclical albuminuria.

A craving for stimulants, probably due, as Dr. Harry Campbell thinks, to absence of some normal stimulant from the blood. Alcohol readily affects these subjects, and in a remarkable manner: the usual physiological and psychical symptoms are exaggerated, the behaviour is much more unrestrained and insane than that of tipsy men commonly is, and there is often complete forgetfulness afterwards. We seem here to be on the borderland of epilepsy.

"Essential" epilepsy itself is a symptom of degeneracy.

There is also a liability to develop a craving for morphine, cocaine, tobacco, and other drugs, and often an increased susceptibility to their effects.

Marked susceptibility to climatic influences, and especially to those of relaxing climates. A climate that is bracing for strong and healthy persons may prove relaxing for those under consideration if the invigorating features be extreme. Degenerates cannot support extremes of any kind, even extreme equability, if the phrase may be permitted. The climate must not be very hot or very cold, very equable or with very great differences in temperature between day and night, summer and winter; it must not be very sunny for prolonged periods (I am ignorant of the effects of extreme and prolonged sunlessness); and must not be very damp or very dry, very breezy or very still. The air of the seashore commonly proves unsuitable.

Fatigue, worry, and intoxications of all kinds increase the symptoms, either for short or for long periods. This explains in part the remarkable action of alcohol in these cases, and it is of great importance in connection with the pathology of degeneracy.

Liability to attacks of indigestion, to catarrhs, to infections and to relapses, to rickets, to infantile scurvy, to local syncope ("dead" fingers, etc.), local asphyxia (chilblains), and local

\[1\] Alcohol is the touchstone of the neurotic, say the French.
gangrene (Raynaud's disease), and to the various neuroses and psychoses. These will be dealt with under the head of Complications.

Some of the insane, and some neurasthenics in a very low state of health, occasionally pass albumin and casts in their urine; this condition clears up after a time, and nothing further occurs to indicate renal disease. Certainly most of these patients, and perhaps all of them, are degenerates, but I am not prepared to say if the condition is dependent on the degeneracy.

To these symptoms must apparently be added the osteogenesis imperfecta described by Drs. Lovett and Nichols at the last meeting of the British Medical Association. The disease appears often to run in families, and the children affected, in addition to the mal-development of the bones, show other structural stigmata that suggest degeneracy.

Psychical.—There are several degrees of degeneracy. They are usually classified according to the mental state, but the more marked forms show a greater degree of bodily degeneracy as well as of mental. Epilepsy may occur in any form. The following list is drawn up in order of severity, beginning with the worst. The classes bracketed together are merely prominent symptoms that are manifested—often two or more together—by degenerates intermediate in degree between the imbecile and the person who is simply neurotic.

1. Idiocy.
2. Imbecility.
   ("Moral insanity."
3. Criminality (some forms).
   ("Volitional insanity."
4. Sexual perversions.
5. "Neurasthenia minor"—neurotism.

Idiocy and imbecility are treated of in text-books, and need not detain us here, except to note that there are perceptible changes—macroscopic or microscopic—in the central nervous system.

In the third group of cases, on the other hand, anatomical changes rarely occur in the central nervous system of a kind that can be observed by our present methods. The cerebral mechanism is obviously disordered, however, and in a way that is essentially the same in the different forms. Some or all of these forms are described in text-books, and we shall confine ourselves here to those fundamental features that are common to them all, and that stamp them as manifestations of degeneracy.

First of these is liability to impulses that are controlled with difficulty or not at all. This want of control must not be mistaken for mere weakness of will, though that also is present. It is due to the overwhelming force of the impulses, which seem to
have no connection with the other mental processes of the patient, who recognises their morbid nature, and often resists them strenuously but ineffectually. "Isn't it strange," said a French patient, "that though I know what I am doing, I say things that I don't want to say?" Resistance to the impulses brings with it a feeling of malaise, of oppression at the chest, or even of choking, accompanied by mental distress; this state passes off at once when the impulse is yielded to. The impulses act in many directions, though the phenomenon is essentially the same in each case. There are impulses to restless and aimless movement, and to laugh or cry without reason, sometimes on undesirable occasions. There is the impulse to use gross language, which seems to occur most frequently in women, who fight hard against it. There are also many so-called manias—pyromania, kleptomania, dipsomania, the mania of counting objects (arithmomania), the mania of buying a profusion of objects that are neither needed nor desired, etc. These impulses may show themselves as early as the fifth or sixth year. They have been described as a special neurosis, called impulsive tic, or Gilles de la Tourette's disease, but they are never found alone.

Another prominent symptom is the occurrence of obsessions—the harassing of the mind by undesirable and undesired thoughts that cannot be driven away. These obsessions are accompanied by anxiety and bodily distress. They are indeed of a similar nature to impulses, being presumably due to erethism of nerve centres, and differ from them only in that the latter lead to acts. Among them may be mentioned that caused by some forgotten name or other word, which leads to a prolonged and unquiet racking of the memory; that caused by the sight or thought of certain objects that are supposed to have an evil influence; and what the Germans call Grübelsucht, or the worrying over some highly complicated or even unfathomable, and often absurd, problem. An extreme example of this last is the case of the man who worried himself over what would happen if God were the number 13. But the problem need not be meaningless; perfectly rational questions may torment a patient and occupy his mind to such an extent as to render him temporarily useless for the affairs of life.

Akin to these obsessions are the folie du doute, and such morbid fears as agoraphobia, claustrophobia, acrophobia (fear of heights), fear of dirt, fear of touching certain things.

A symptom already referred to is weakness of will. These patients are very suggestible, a fact which helps to explain the presence in the same individual of such apparently contradictory features as impulsiveness and fixed ideas. The mind does not pursue the even tenor of its way, thought succeeding to thought in logical sequence, and appropriate action or thought following on sensation, but is liable to be seized and whirled about by
impulses and thoughts that almost seem external. This constitutes impulsiveness, but it may happen that an obtrusive thought causes such emotional disturbance that it is constantly present, cannot be eradicated by any process of reasoning, and dominates all thought and action. This is a fixed idea. If the field of consciousness be much narrowed, such an idea may take full possession of the mind even without causing extreme emotional disturbance.

Other symptoms, allied to the impulses, are restlessness, excitability, irritability, and incapacity for sustained exertion. Excitement may rise to such a pitch as to cause momentary forgetfulness, and perhaps even unconsciousness, or, at all events, a state in which the mental powers are in temporary abeyance, and need a decided sensory stimulus to arouse them. Here, again, as in the case of alcoholic excess, we seem to be on the borderland of epilepsy. There is a want of reticence, which is not due to lack of modesty so much as to the impulse to utter whatever is in the mind. There is excessive emotionalism, and the emotions are often morbid in nature. Sexual perversions may occur, and, indeed, masturbation is probably very common in these cases, as well as in those of idiocy and imbecility; perhaps it is not rare in any degree of degeneracy.

Some mental faculty may be deficient, though the remainder are practically normal. Thus there may be marked deficiency of the moral sense, which is not the same as want of self-control, but is the absence of certain qualities that are hereditary in the race; or there may be curious lacunæ in the intellect, such as inability (apart from a neglected education) to spell, to calculate, to appreciate music.

The impulsiveness, the weakness of will, the uncontrolled action of the instincts in certain directions, and sometimes the irregular distribution of the intellectual or moral lacunæ, cause the character to appear singularly unbalanced.

In some instances the mind seems to cease developing at or soon after puberty—a connecting link with imbecility.

The last group comprises the neurotic and neurasthenic, terms practically synonymous. It will be well to trace the life-history of a case of neurasthenia minor from birth to maturity, without confining one's self to the psychical features. The child may be feeble at birth, but it often happens that nothing abnormal is noticed, even anatomically. The first symptom usually observed is a marked febrile reaction to vaccination, and later there is considerable disturbance with teething. The baby may be lively, but he tires easily. Sleep is often irregular, and food may be refused frequently, or very little taken. Sickness after feeding is commoner than in the case of healthy babies. There may be constipation, with or without frequent attacks of diarrhoea; mucous colitis is not rare, and pseudo-membranes may be passed.
Anatomical stigmata are often shown during infancy, though not to the same extent as later. The child is very liable to catarrhs and disorders of digestion, and, when a little older, to the exanthemata, as well as to attacks of "stomach-ache," hiccup, and vomiting; a trifling derangement brings on pyrexia, and there may be febrile attacks, the origin of which cannot be ascertained. When a year or two old, he will very likely sleep with his mouth open, and be found to have large tonsils and naso-pharyngeal adenoids. He may eat soil or wall plaster, or may have other bad habits. In boyhood he will still tire easily. His hand will droop when at rest from want of tone in the extensors of the wrist (Dr. Warner's "feeble hand"). He will be particular about his food, disliking many articles of diet, especially the fat of beef. His sensory acuity, activity, and co-ordination will be below the normal; and, as a result of his deficiency in these three respects, his consciousness will be less vivid than that of normal boys, as well as, possibly, narrower in range. It is not sufficiently recognised that consciousness varies in degree, being quite clear in some, while others perceive all things as through a window, darkly. Moreover, consciousness varies in the same individual under different conditions, fatigue especially having a depressing influence on it. His imperfections in consciousness and power of observation will be exemplified by his slowness in finding a lost toy. He will also be worse at games, and altogether less handy, than his companions. He will be excitable, and "extra movements" will readily be aroused. He may bite his nails. He may be bright and clear, and may have a very good memory, but will be lacking in attention and perseverance, and may be given to dawdling. He will very likely read a great deal, because reading is easier for him than playing, and his deficient vigour needs less outlet. Reading is also easier than thinking; in fact, it is apt to be a manifestation of laziness (and should not be indulged in by anybody except for definite reasons). He will be highly suggestible and easily led. About puberty he will take to day-dreaming, and possibly to masturbation; he may show the "pathological piety" of which Dr. Wendell Holmes wrote. He may be hesitating, and may exhibit a slight degree of the folie du doute, returning to a completed thing to make sure that he has really done it. He will very likely be timid, but may be led by emotions or ideals to perform very courageous acts on occasion. He will probably show some peculiarity of temperament, perhaps the commonest being shyness with outbursts of forwardness; he may be reserved or garrulous, ready to take offence or to imagine himself injured, querulous, capricious, obstinate, vain, or revengeful. In some cases there is mental dulness; and it must not be forgotten that this may depend on remedial sensory defects, such as shortsightedness or deafness. In adolescence he may form an exaggerated estimate of his own abilities. His suggestibility and lack of
judgment will render him liable to be fascinated by all sorts of new ideas and doctrines, to which he will adhere with an obstinacy that savours somewhat of quixotism and somewhat of self-sufficiency. The listless turning away from effort may lead to loafing, and this may help to create the habit of drinking, to which these subjects are only too liable. In adult life the languor continues, and is most marked in springtime and in the early morning. The "feeble hand" will still be shown. Owing to weakness of will and to the habit of day-dreaming, there is a want of power to concentrate the attention, and to roll away unpleasant thoughts and worries from the mind. This, with the want of vigour, causes an undercurrent of depression, though neurotics are keenly sensitive to pleasure. The intellect is often acute, but soon tires; moreover, it cannot move rapidly from one subject to another, but needs apparently to "limber up"—as if the patient had Thomsen’s disease of the intellect! The will is habitually weak, but neurotics are capable of heroic efforts of volition at times. The memory is often remarkably good, so far as retentiveness is concerned, but is apt to be deficient as regards readiness of recall. Judgment is bad, partly from the preponderating influence of the present notion, sensation, or emotion, and partly from inability—through lack of attention—to consider all the aspects of the case. The other psychical symptoms are similar to those in the last group of cases, but much less marked. Neurotics are impulsive, but their impulses are far less forcible, being rarely sufficient to prevail against religious, legal, and social sanctions, except sometimes in the cases of the alcoholic and those with sexual perversions; moreover, resistance to the impulses is not accompanied by distressing physical sensations. Their impulsiveness rarely comes to more than this, and not always to so much: that whatever they want, they must have immediately; whatever thought comes into their heads, they blurt out at once; and new notions, as we have seen, carry them away without allowing deliberation. If they do not curb their impulses, they may develop tics and bad habits, such as Dr. Johnson’s custom of touching all the posts in Fleet Street. They are excitable, irritable, restless, and sensitive, and often show great delicacy of feeling; they are suggestible, and apt to be emotional. There may be a lack of reticence. They may be over-scrupulous about the accuracy of their statements or the correctness of their actions to a degree involving the folie du doute, and often causing annoyance to others. As a rule, they are not well fitted for the struggle of life; the cloister suits them better than the world.

It will be remarked that in certain respects the mind of the neurotic adult resembles that of the normal child; and this suggests that the condition may be merely one of non-development in certain directions. But in view of the facts that the neurotic adults were abnormal as children, and that there are
transitional states between their mental constitution and that of more marked degenerates, whose minds certainly do not resemble those of the young, we may conclude that there is actual mal-development.

It must not be supposed that all neurotics are incapable of action. Many prove themselves able, energetic, and successful men of business. Some have changed the course of history.

Conversely, it is not the case that a subnormal development of one or more of the mental faculties necessarily indicates degeneration. Faulty education accounts for a great number of such cases, and it is also possible that, as with the bodily stigmata, there are congenital defects unconnected with degeneracy.

Pathology.—The morbid anatomy of the severer forms of degeneracy—idiocy and imbecility—is described in text-books, and need not be referred to here. In the slighter forms, that of the nervous and glandular systems, the changes in which are the most essential, is still unknown. The pathology, however, may to a large extent be inferred from the symptoms.

A most important condition, and one on which some of the others depend, is irritable weakness of the nervous system. On the bodily side, this shows itself by the frequent occurrence of disordered movements; the nerve centres are so readily discharged that impulses flow into unwonted paths. To it are also due the restlessness, the speedy tiring, both muscular and sensory, the inco-ordination, amounting usually to no more than want of handiness, and tics of various kinds. On the mental side it shows itself by excitability, by lack of attention and perseverance, and by impulses and obsessions. There is, in fact, a state of chronic fatigue of all the faculties, including perception, intellect, action, and will. The expression "chronic fatigue" is used advisedly; there is not mere asthenia, but a state in which action is readily excited, but takes an abnormally long time to reach its maximum, and in which effort cannot be sustained at an even pitch, but shows marked oscillations—conditions characteristic of fatigue. There is almost always vasomotor instability.

Metabolism is defective, as is shown by the frequency of disorders of nutrition, by "bilious attacks" (which, no doubt, are a form of nerve storm, but are undoubtedly connected with diet in many instances), by the abnormal odour of some degenerates, and by the frequency of signs of perverted metabolism (excess of urobilin, indican, uric acid, phosphoric acid, or oxalate of lime) in the urine of neurasthenics. There are often, and possibly always, abnormalities of internal secretions. The defective metabolism is probably to be explained by secretory disorders, and so, perhaps, are the faults of development. The likenesses between Graves' disease and neurasthenia suggest an abnormality of the thyroid secretion in many degenerates, and in others there is an elong-
ation of the limbs such as occurs also in those whose testes have been removed in infancy.

A very important pathological condition is diminution of sexual power, which is probably one of the causes of the extinction of degenerate families.

Muscles, bones, ligaments, blood vessels, skin, and connective tissue often show either hyperplasia or hypoplasia; most often hyperplasia in the case of connective tissue, hypoplasia is the case of muscles and blood vessels.

Finally, we must mention the presence of one or more gross anatomical abnormalities.

From the above list of its pathological features, it may reasonably be inferred that degeneracy is a fault of development, affecting many or all of the bodily systems, though the chemical or histological changes in the nervous and glandular systems are still unknown.

Dr. Féré's theory that degeneracy is a dissolution of heredity will be referred to under etiology.

(To be continued.)

THE SO-CALLED "PANCREATIC REACTION" IN THE URINE.

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There appeared in the Edinburgh Medical Journal for November 1906 an article entitled "A Special Consideration of the So-called Pancreatic Reaction," in which Dr. P. S. Haldane criticised a now obsolete method of performing the "pancreatic" reaction, and adversely commented upon a long-abandoned working hypothesis that formed the original basis of the method. Most of the points raised in that communication have been already dealt with, and such belated criticism would not now call for comment from me, were it not that there may be some who, like Dr. Haldane, are unacquainted with the advances that have been made in this subject since 1904, and would therefore be likely to attach undue weight to the results of his laborious researches and the conclusions he draws from them.

It was not my intention to suggest in my original paper that the presence of glycerin had been proved in the urine in pancreatic

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1 According to Gross and Sencert (Rev. de chir., Paris, 1905, No. 11), this abnormality is due to absence of an internal secretion produced by the epithelial cells in the interstitial tissue of the testes.

2 Lancet, London, 1904, May 5, 18; Brit. Med. Journ., London, 1904, June 18, July 7, 16; Trans. Royal Med. and Chir. Soc., 1905; and Brit. Med. Journ., London, 1906, May 19.