Stephen Massett Webb

March 31st 1852.

an exceedingly well composed theme
subject well handled

On Hereditary transmission; or the Inheritance by offspring of Somatic and Psychical constitution derived from parents.

No References

p. 6. Cheese – Psychical?

7. 7 deaf & Dumb

10. 4 habitues in a family

12. Lord Horton's Lineage

14 Castle?

34. Cancer hereditary?

44. Hydrocephalus? because hopeless

Introduction

It is remarked by Lord Bacon that "to use many circumstances ere you come to matter, is wearisome; and to use none at all is but blunt." In accordance with this rule, I shall introduce the following essay with a few brief prefatory remarks; and, then, shall pass on to the consideration of the physiological and pathological doctrine, which I have chosen for its subject. Although the range of the natural sciences, connected with the healing art, is so extended, that Medicine may truly be said "to have levied a contribution from all the departments and provinces of nature, and compelled them to yield their service to man"; and, although the disorders to which the human frame is exposed, are so various in themselves, and so differently combined in individual cases, that the field of medical enquiry, in its most limited sense, is one of the widest, which the human mind has attempted to explore; yet, on due consideration, it will be no matter of surprise, that the Student's first difficulty in the composition of a medical academical thesis, is the choice of a Subject. When it is considered, that the time which is usually spent at a University, is not more than sufficient to enable the learner to lay a foundation, in each of the several branches of Science, which pass under his notice; and, that to gain eminence in any one of them, is a distinction, to which few, from the force of circumstances, are permitted, even in after life, to enjoy; the production of new views or observations, which may bear the test of accurate criticism, in essays such as the following, must be rare — The intellect of Europe, at the present day, seems to have left for a time the region of abstract thought, and to have betaken itself to that of observation — The great names of the age are those of

Astronomers, Chemists and Microscopists, whilst, on looking back, the eye is arrested by those of Poets, Lawgivers and Moralists. This temporary tendency of the civilized mind could not exist without remarkable results. Natural science has advanced with Herculean force and electrical rapidity, in comparison with which, all the progress of former days, must be regarded but as the faltering steps of its infancy. The comprehension of the present position of any one department, requires no ordinary effort; a further advance can hardly therefore be expected from the mere tyro. The writer of the following pages has, therefore, declined the attempt; and has contented himself with choosing a general doctrine, whose truth is admitted by all; and with endeavouring to refer to certain laws, such facts, in connection with it, as are within his reach. In prosecuting his task, he has been cheered by the thought, that although the labours of the mere compiler, are not to be compared with the higher efforts of the designer, or with the more laborious ones of him who supplies the materials; yet, they at least cannot be dispensed with, but are equally necessary to the completion of the edifice.

"On Hereditary transmission; or, the Inheritance by Offspring of Somatic and psychical constitution derived from Parents."

In treating of the above subject, it has appeared to me most convenient, to arrange the information, which I have been able to collect, under the following heads.

1. On the General Doctrine of the transmission of physical peculiarities.
2. On the alleged transmission of intellectual powers within the limits of a healthy mental constitution.
3. On the transmission of deformities, including deficiency and redundancy of parts.
4. On the transmission of structural and functional diseases, and morbid tendencies.
5. On the circumstances and influences by which hereditary tendencies may be modified.

Section 1st

On the general doctrine of the transmission of physical peculiarities.

"That thou art my son I have partly thy
Mother's word, partly my own opinion;
but chiefly a villanous trick of thine eye,
and a foolish hanging of thy nether lip
that doth warrant me" 1st Part of King Henry IV - Act 2.

That children inherit the forms, features, constitutions and habits of their parents is a truth which must strike the most careless observer. The facts in proof of it have been so numerous and constant, that they have been referred to a fundamental law, deviation from which must be regarded as exceptional. The person who first beholds the child almost instinctively endeavours to trace, in its yet unformed features, some lines of likeness to the parent stock. We observe such resemblances with pleasure; "we love to see the daughter inheriting the countenance which charmed us in the mother, or to trace the almost forgotten grandfather returning to life in the features of a little child". To this law must doubtless be attributed many of the physical differences observed in the races of mankind, although in the production of these, numerous other influences have their share. This Doctrine however never infringes upon another fundamental law of our species; viz, that the personal identity of each individual is always preserved in his form, features and constitution. A consideration of the wonderful similarity and yet the constant difference of mankind, cannot but fill the mind with the most exalted idea of the infinite creative resources of the Author of their being.

Many and remarkable are the instances of physical peculiarities transmitted by parents to their children. We observe these running through a long line of descent; and it is not improbable that were the history of every family known, in by far the greater proportion, we should find some circumstance of bodily conformation, however slight, by which its members might be recog-nised. Numerous instances might be quoted in illustration, but perhaps few are more remarkable, than the well known and singular thickness of the upper lip, observable in the Imperial House of Austria. It appears, that this peculiarity was introduced into the Hapsburg family many cen-turies ago, by an intermarriage with the ancient house of Jagellon. The lineaments of the present Royal family in this country are no less distinctly to be traced through successive generations, and the hereditary beauty of the females of some of our noble houses, still call to mind the portraits of their celebrated ancestress Nell Gwyn. But not to multiply such instances, I shall here quote a case recorded by Signor Alessi, which is amongst the most remarkable I have met. A person presented himself to M. Alessi with chronic ophthalmia of the right side, when he observed that the upper eye-lid of the left side was so relaxed, as to cover about a third of the pupil. On questioning the patient it was found, that this affection was hereditary, his father having suffered from it as well as his son and grandson; and to increase the singularity of the case, the deformity changed side with each generation. M. Alessi visited and examined the man's son and grandson, and found them affected as had been described. He attributed the ptosis not to atony of the elevator muscle or paralysis of the third nerve, * but to a flattening of the supra-ciliary ridge, especially towards the outer angle;

* In Braithwaite's Retrospect, [Vol. 2. p. 162] from which this case is taken, paralysis of the 4th nerve is stated. This must have been a misprint.

so that the integuments, not being supported on the usual prominence, fell over the eyeball - Dr Holland relates a case of a man, who had a singular elongation of the upper eyelid, seven or eight of whose children were born with the same deformity - The same author attests the fact of left handedness taking the character of a family peculiarity - Not only, however, do we constantly observe bodily conformation transmitted from generation to generation, but we also see, that idiosyncrasies in temperament, taste, feeling, smelling, peculiar susceptibilities to the action of certain substances, are no less matters of inheritance - The transmission of temperament becomes frequently an hereditary tendency to disease, and will be more fully considered in the fourth section of this essay; but the inheritance of the other peculiarities alluded to, although not so important, are yet sufficiently curious and by no means rare - In illustration of the descent of peculiarity in the sense of taste I may narrate the following case - A Lady of my acquaintance has, from her ~~earliest~~ infancy had a particular aversion to a common article of food (cheese), she declares that nothing can be more disgusting to her, and she is sensibly affected by its odour and appearance. Her maternal grandmother exhibited the same aversion, and she has two cousins to whom it is equally disagreeable; the intervening members of the family having possessed the ordinary relish for the article in question.

2. X

Medical men are fully aware that the members of some families are particularly susceptible to the action of certain medicines, which in similar doses are given to others with impunity - This is the case particularly with opium, preparations of Mercury and many purgative drugs - The knowledge of these

idiosyncrasies can only be acquired by previous acquaintance, but it is essential to the medical treatment of such individuals.

Some remarkable instances are on record of hereditary peculiarity in the sense of sight, or rather in the perception of differences in color. Dr. Holland says, that in one family a father and two children were unable to distinguish red as a colour. In another family, three brothers and two or three of their children were unable to distinguish blue from pink; and he further states, that cases of this kind are far from infrequent. An hereditary disposition to blindness is noticed in some stocks, and we find instances of several deaf and dumb children in families, although this affliction is seldom observed to be transmitted directly from parents, probably for the reason, that the deaf and dumb rarely marry. Dr. Adams states, that of 148 scholars upon the foundation of the Deaf and Dumb Institution, one was of a family where there were 5 deaf and dumb; one, where there were 4; eleven, where there were 3; and nineteen, where there were 2; in thirteen out of seventy-two candidates the privation extended to brothers and sisters.

Nevins 9

To pass, however, from these general remarks, we may observe that under the law of hereditary transmission, other general propositions may be ranged, by some of which the effects of the former are rendered subservient to the production of the differences which we see in races, and to the preservation of the physical identity of individuals. We shall proceed to notice some of these.

1. In a community composed of individuals of the same species, a new variety will occasionally arise, produced by circumstances entirely hidden from our observation; an individual shall be born exhibiting peculiarities of structure, of which no trace is to be found in the parent stock.

Instances of this kind are not wanting in our own species, and many may be referred to from amongst the lower animals. We are informed that in the black race which repeopled Sennaar, some hundred years ago, a variety exhibiting red hair and a red complexion sprang up, and that they under the name of "El Akmean" "the red people" form to this day a separate or distinguishable caste. Some other instances bearing upon this proposition will be adduced in the third section of this Essay, when we speak of various deformities.

Before, however, quitting this head I cannot but refer to the singular example of origination of variety in form, which has been noticed amongst the sheep of New England within the last few years. A male lamb was produced by an ordinary ewe, remarkable for the shortness of its limbs, the crookedness of its fore-legs, and the length of its body. This animal became the progenitor of a race to which from their inheritance of the above characteristics, the name "otter sheep" has been given. From their inability to leap over fences, the propagation of the variety has been encouraged.

2. Such connate varieties having a tendency to become transmitted to offspring, and the differences being further fostered by circumstances of climate, soil, intermarriage &c, produce in a series of years the physical distinctions which separate races. It has, I think, been clearly demonstrated by Dr. Prichard, that to these circumstances aided by the isolation of families, and the effects of moral and mental culture, are attributable the distinctive characters of the different families of mankind.

3. Another general proposition is, that hereditary transmission does not always

proceed without interruption or break. Sometimes a whole generation will be passed over without exhibiting the particular trait, which however will reappear in a third, or subsequently. This has been noticed by Boerhaave, "Silente sepe morbo in genitore dum ex avo derivatur in nepotem." A father shall transmit to his children the constitutional peculiarities of his grandfather or great grandfather, and yet he himself be apparently free from them. To this occasional alternation the name of "Atavism" has been given. Examples of it are common, and sometimes two tendencies will be found to replace each other in alternate generations. Dr. Parsons relates a case, in the Philosophical Transactions, of a Negro, who was married to a black woman in Virginia; in process of time she was confined and delivered of a white child. The circumstance much distressed her, as she was apprehensive that her husband might accuse her of infidelity; she, therefore, begged that the room might be kept dark, that he might not see the child. He however had the child brought to the light and seemed highly pleased with it. She imagined that he dissembled his resentment, till she should be able to go about, and that then he would leave her; but in a few days he said to her, "You are afraid of me, and therefore keep the room dark because my child is white; but I love it the better for that; for my own father was a white man, though my grandfather and grandmother were both as black as you and myself; and although we come from a place where no white people were ever seen, yet there was always a white child in every family that was related to us".

4. We observe occasionally that peculiarities are only transmitted to children of one sex; those of the other not exhibiting the hereditary trait. It is popularly believed that Sycosis thus transmitted appears in the males and females

only in alternate generations, though this law does not appear by any means invariable. Cases are recorded of hereditary deafness being only observed in the males of a family; ichthyosis has been noticed to be confined to the same sex, although the tendency was derived from the mother. Admitting Bronchocele to be an hereditary disease, we much more frequently find it attacking females than males, but this is by no means unexceptional. The tendency to fatty accumulation in the Hottentot and Bushman races, appears from the account given by Mr. Barrow, to be limited to the females. I am acquainted with a family, in whom an hereditary tendency to Diabetes has been only transmitted to the daughters, four of whom have already fallen victims to it, the sons having entirely escaped. In this case the morbid tendency was derived from the father's family.

5. In some cases peculiarities are only transferable through one sex. A remarkable instance of this is quoted from the Edinborough Medical and Surgical Journal (Vol 4. p. 252) by Dr. Prichard. "In a family at Joer the individuals for nine generations had perfect thumbs, but instead of fingers, had only the first phalanx of each, and the first and second joint of the ring-finger of the left hand, these rudiments of fingers having no nails. This is said to be the description of the whole family, as it had been, with slight variations, that of nine numerous generations. It is added that it was the women only who had the misfortune of entailing this defect upon their offspring, which they did almost uniformly.

6. We have already seen that there is a tendency to perpetuate connate variations, which may spring up from time to time in a

community. Occasionally, however, such differences are not so transmitted, but die with the individual who first exhibited them. It may be considered as no less true, that alterations in form and structure, which are the result of external circumstances during life, are not as a rule transmipable to offspring. To this, however, as to the former law, many and curious exceptions are recorded; some of which will be mentioned in the section on Hereditary deformity. These, however, must at present be regarded as deviations from the established law, produced by circumstances which have hitherto eluded observation.

7. It may be stated as a rule, which however is not to be considered unexceptionable, "that when one parent only bears the transmipable tendency, the disease appears to be most apt to break out in the children, who most resemble that parent in their physical conformation and appearance". We shall, however, notice in proceeding that the application of this doctrine to one disease, (insanity,) is opposed to the views of a modern continental writer; but his opinions require to be supported by further and more extensive observations.

8. Influences acting for a continued time on parents, will produce a change in offspring, although it may appear that the parents shall have resisted their effects in their own persons. Wild animals which on being subjected to the influences of domestication, have retained their original ferocity, will yet show the effects of these influences in their offspring; these approaching nearer in outward appearance and disposition to the domesticated standard. The same is true of savage races of men brought under the influences of civilization. Habitual drunkards

are frequently known to have epileptical or insane offspring, and according to Dr Adams, women who are constantly addicted to intemperance, generally produce immature or idiot children.

Q. It is a remarkable fact that the progeny of one male parent shall inherit some of the characteristics of another male, by whom the female parent shall previously have had offspring. This is frequently observed in the lower animals. It is well known that if a bitch of pure breed has a litter of puppies by a mongrel and a subsequent litter by a dog of pure blood, one or more of the last litter will nevertheless exhibit some of the marks of the mixed breed. (As far as my own enquiries among those who breed dogs extend, I find that the puppies in such cases do not exhibit equally the mongrel characteristics; on the contrary, they will appear strongly in one or two, the rest escaping them to a much greater extent.) Mayo mentions that a similar occurrence was observed by Mr Giles in a litter of pigs, which resembled in colour a former litter by a wild boar. Several other instances are mentioned by Mr M'Gillivray, observed amongst horses, bullocks &c. In several foals in the Royal Stud at Hampton Court got by the horse Actaeon, there were unequivocal marks of the horse Colonel; — the dams of the foals were bred from by Colonel the previous year. The best-known and most remarkable case of this kind, however, is that of Lord Monson's mare. This animal was first covered by a male Quagga and produced a hybrid. She was afterwards thrice covered by horses, and every time the foal she bore had still distinct though decreasing marks of the Quagga. It is stated by Haller, that when a mare has had a mule by an

ass and afterwards a foal by a horse, the foal exhibits traces of the ass. In the human subject it is more difficult to substantiate cases of this kind, although it seems probable that morbid tendencies may be transmitted in this manner. Dr. Dyce, quoted by Dr. Harvey, says that he has certainly known one instance of a Creole woman who bore fair children to a white man, and having afterwards by a creole man other children, they (the latter) bore much resemblance to the white man in features and complexion. Professor Simpson knew a young woman who resided in Edinboro and was born of Scottish parents. Her mother had previously had a natural mulatto child by a Negro man-servant. The young woman exhibited distinct traces of the Negro. Dr. Harvey relates one or two cases where the scrofulous diathesis appeared in the children of a second husband, apparently derived from the former marriage, the wife and second husband being to all appearances healthy. But in these cases in attributing the cause there is so much danger of erring, and so many ways in which mistake may be produced, that they do not seem conclusive. In those cases where syphilitic taint shows itself in the children of a second husband, which has apparently been derived from a former connection, it may be doubted whether the disease had not been communicated directly from the first husband to the mother, and having become constitutional in her, would therefore almost necessarily be transmitted to her offspring. Three hypotheses have been advanced in explanation of this law. The first is that a permanent influence is exerted by the seminal fluid of the first male on all the ova of the female. This, although,

the most probable of the three hypotheses, hardly admits of a full acceptation. In subsequent litters of puppies, as above stated, we do not find all the animals exhibiting equally characteristics of the first connection.
The second is that proposed by Mr. Jas. Mc Gillivray of Huntly; it is, that a kind of inoculation or tainting of the blood of the Mother is produced by the Foetus, which possesses in part the constitution of the male parent; thus rendering the mother, if the Fœtus be a hybrid, herself a cross. To this it may be objected that no communication has ever been traced between the maternal and foetal circulation. (If this objection be valid, is it not equally so to the doctrine which allows a foetus in utero to be inoculated with a morbid poison, which has found entrance into the Mothers system during her pregnancy? We have the evidence of many writers, and amongst others that of M. Ricord, to prove that if a pregnant female become affected with indurated chancre and its consequences during her pregnancy, her child will acquire and inherit the diathesis. This point will be referred to again when speaking of hereditary venereal disease.)
The third hypothesis ascribes the facts under consideration to the influence of the imagination of the female. Should it be proved beyond doubt that morbid poisons may be transmitted from a former husband to the offspring of a second, this hypothesis cannot be considered as tenable, for it seems impopible that the presence of a specific poison should be produced by the imagination of the parent: But as long as we confine ourselves to the consideration of outward configuration and healthy characteristic, (by healthy here, I mean not

tainted by any specific poison) some cases are on record which would lead us to believe it not utterly impossible. Many authors have denied the influence of maternal imagination upon the fœtus, but the universality of the popular belief on the subject, the credence which has been given to it by men whose names are amongst the greatest, and above all, some of the recorded cases, are most powerful arguments in its favour – The mode in which the patriarch Jacob influenced the colour of the flocks committed to his charge, may be cited in favour of the doctrine; and I have heard of some experiments having been performed by cattle breeders, which were productive of, to a certain extent, similar results. The terror of King James the 1st of England and 6th of Scotland at the sight of a naked weapon has been ascribed by writers, to the influence of the murder at Holyrood on his mothers imagination – Mauriceau relates a somewhat similar case of a pregnant lady, who being advanced eight months in her pregnancy, was suddenly informed of her husbands' murder, whose dead body was soon after brought to her. She was "immediately surprised with a great trembling" and was presently delivered of a son, who was all his life time "troubled with a shaking of both hands" so that "when he signed his contract of marriage, they who knew not the reason of it when they saw his hands shake, thought it was through fear of his ill bargain, of which they were disabused when they heard the catastrophe which hastened his birth". Smellie relates a case of a child that was born with the frontal, parietal and upper part of the occipital bones wanting. "The account given by the mother, as the probable occasion of this disaster is as follows; Upon the month of April 1747 when she was near two months gone with child, she was grievously frightened with thinking on Lord Lovat who was that

day to be beheaded - Her husband was gone to see the execution among the crowd on Tower Hill, and when the news came to her hearing, that a scaffold was fallen down, by which accident many people were hurt, she immediately feared that her husband might be of the number and was greatly affected - While she was under this dread and apprehension an officious, idle woman came to her and said that a friend of hers, for whom she had a great regard was killed on the spot, and that she saw his brains on the ground; upon this the poor woman put both her hands on her head in great agony, and immediately fainted away". Dr Whitehead relates a case in which a healthy mother had five children born at the full time of utero-gestation, each remarkable for plumpness and vigour: the first, third, and fifth of the children had defective development of the left eye, amounting in one to deformity, and the second and fourth had complete loss of vision on the same side - The mother attributed these accidents to her perpetual grieving during her pregnancy on account of her elder sister's child who happened to have congenital blindness of the left eye - The following case fell under my own notice - The servants of a family, in which the youngest child was much disfigured by a double hare-lip, married - I attended the woman in her first confinement; the child was born with cleft-palate and hare-lip - But not to multiply instances I shall content myself with referring to the very conclusive and remarkable one recorded by Dr Montgomery who says, "A Lady pregnant for the first time, to whom I recommended frequent exercise in the open air, declined going out as often as was thought necessary, assigning as her reason that she was afraid of seeing a man whose appearance had greatly shocked and disgusted her; he used to crawl along the flag-way on his hands and knees, with his feet turned up behind him,

which latter were malformed and imperfect, appearing as if they were cut off at the instep, and he exhibited them thus and uncovered in order to excite commiseration. I afterwards attended this lady in her lying-in, and her child, which was born a month before its time and lived but a few minutes, although in every other respect perfect, had the feet malformed and defective, precisely in the same way as those of the cripple, who had alarmed her, and whom I had often seen." Here was a disgusting object complained of at the time, followed by an effect in exact correspondence with the cause, the similarity between the two being so great, "that it is difficult to suppose chance could have been so ingenious or so exact an imitator". I feel that I cannot better conclude this paragraph, than in the words of Morgagni, as quoted by Dr. Montgomery. "Although I do not approve these things, (the absurd stories) there are cases, wherein it seems to me to be very hard to depart totally and altogether from that opinion, which is common to the greatest men."

10. Lastly, I may end this catalogue of general propositions with observing, that little is at present known of the laws by which it is determined, whether a child shall inherit the characteristics of one or the other parent, or perhaps of both equally. It is true that we observe insanity and phthisis more frequently transmitted from the male or female parent to the children of the same sex; so that the daughters more frequently inherit these diseases from the mother, the sons from the father, but beyond this little is known. That these circumstances are governed by fixed and determinate rules, there can be no doubt, for nothing in the natural world happens strictly speaking by chance; every effect is produced by a fixed law of causation. An occurrence may appear to us exceptional but it cannot be irregular. "In reference to

this subject of family likeness," says the great Harvey, in his work on generation, "we may be permitted to enquire why the offspring should at one time bear a stronger resemblance to the father, at another to the mother, and, at a third, to progenitors, both paternal and maternal, further removed? particularly in cases where at one bout, and at the same moment, several ova are fecundated." This question has never been answered, and its solution is probably beyond the limits of human enquiry.

I shall now take into consideration a few of the more obvious physical characteristics, which we commonly observe hereditary in families.

1. Of Complexion and Colour. These are, as a rule, derived from parents, although, as we before noticed, when we referred to the inhabitants of Senaar, it appears possible for connate varieties to spring up. (The red people above referred to, are not to be confounded with the Albino, which it seems occasionally appears in all coloured races.) In some cases Albino parents have had albino children, but this is not constant - out of seven instances of Albinos related by Mr. Jefferson in his account of Virginia, five were women, four of whom married negroes and had children; but in the case of one only of the four was the child an albino. In cases where Europeans have contracted marriages with negroes, the child is usually of intermediate complexion, i.e. a mulatto. Dr. Prichard believes, however, that this is more especially the result, when the Europeans are not of the fair or xanthous complexion, (the most opposite to that of the negro,) but of the melanous, or black haired variety. In other cases, instead of the offspring being of an intermediate colour they are inheritors of the unaltered complexion of one parent. "A black man married a white woman in York, several years ago," says Dr. Parsons, "I had an account from an eye witness. She

soon proved with child and in due time brought forth one entirely black, and in every particular of colour and features resembling the father, without the least participation from the mother." Dr. Prichard relates the case of a family of mixed breed from the W. Indies, in which one individual, a young man, was of very dark colour, and had African features; his sister had English features, a fresh complexion, and red hair. Mr. White speaks of a negress, who had twins by an Englishman; one, was perfectly black with short, woolly, curled hair; the other, was white with long hair. But, as the result of such unions, the child may exhibit the two colours distinct, on different parts of its body. Mr. White cites some cases of this kind, from the Zoological magazine. I shall quote one as an example. "A few years ago, a person kept a public house in Tooley St., Southwark, the whole right side of whose body was white, and the left side black. His father was white, and his mother black." Dr. Parsons has related a similar instance, in which the right buttock and thigh were quite black, whilst the rest of the body was of European Complexion. Instances are not wanting in this country of individuals descended from English parents, presenting the different complexions of their father and mother, on the opposite sides of their face; and in some instances the difference extends to the colour of their eyes and hair. Dr. Whitehead has mentioned a striking example of this peculiarity.

2. Stature. That this is hereditary, there can be no doubt; but the more striking examples must necessarily be sought for, in those cases which have varied either by greatly exceeding, or falling short of, the ordinary standard. Accordingly, we find that both dwarfs and giants have offspring of a similar stature to their own; so that, it is not difficult to account for

the existence of a gigantic race, such as the Patagonians, or of a diminutive one, as the Esquimaux and Bushmen; the hereditary tendency being favoured by circumstances of climate, soil, mode of living, intermarriage &c. "A great number of the present inhabitants of Potsdam," says Dr. J. R. Forster, "are of a very high stature, which is more especially striking in the numerous gigantic figures of women. This, certainly, is owing to the connexions and intermarriages with the females of that town, of a regiment of gigantic guards, belonging to the king of Prussia, who were quartered there during the space of fifty years. Mr Lawrence refers to the case of a well proportioned dwarf of Nuremburg, who measured about three feet in height. Her parents, brothers and sisters, were dwarfs. Count Borowlaski measured 28 Paris inches; he had a brother of 34 inches, and a sister of 21.

3 I have observed some remarkable instances of obesity, transmitted from generation to generation. The members of one family in which this was the case, were all in the military profession, and the inconvenience which it gave them was great. They could not mount or dismount from their horses without assistance. This transmission, to my knowledge, existed through three generations.

I must here close this introductory section, which has already exceeded its proposed length. I am aware that it is but a compilation, and a very imperfect one, but relating to such a subject it is hardly to be expected that a student can collect many fresh facts, and the resources from which he may draw are necessarily limited. Should the details, into which I have entered, be deemed trivial or unworthy, my apology must be that they were intended merely as illustrations of the great Doctrine under consideration, and that the relation of a case frequently produces an effect, which the mere enunciation of a law fails to accomplish.

Section 2nd.

On the alleged transmission of intellectual powers, within the limits of a healthy mental constitution.

(In this section, I wish it to be understood, that I leave entirely out of the consideration idiotcy, and weakness in the development of intellect, dependant on physical causes; which have been proved to be hereditary in certain cases - I wish to confine myself to the consideration of intellect within the limits of health; — the "Sana mens in sano corpore.")

In perusing the biography of men of genius, we, in most cases, look in vain for proofs of its having been inherited. We, however, frequently find in place of these, that their progenitors have been individuals of energetic temperament, and often of determined industry; and, that these qualities, being transmitted to their more gifted offspring, have enabled them to accomplish those things, which have given character and ornament to their age and nation. It appears to me, that temperament is more a subject of hereditary transmission than intellectual power, although, it must be allowed, that in many cases a certain mental bias is observed, similarly to mark the members of a family. It may be, that amongst ourselves the influences of education, which have been far more carefully and assiduously applied to the mind than to the body, have in many cases so changed the character of the former, that connate peculiarities are lost sight of amidst acquired dispositions; and, that tendencies, though originally weak, become by exercise so strong as to overbalance those, which in a primitive state, would have proved the more powerful. To these effects of education and training may, there is reason to think, be ascribed the tendency to a particular pursuit, which is sometimes seen in a whole family. The

children of the painter, to whom the Studio is a nursery, and whose earliest intellectual perceptions are called forth by works of art; will in all probability follow their father's profession: but, the chances are that but one, or even none, may exhibit the high powers of imagination, combination, judgment and reflection, which are necessary to constitute a great painter - Raffaelle was the son of a very ordinary artist of Urbino; and, although there were others of the family of Teniers who painted, not one of them will bear comparison with David, surnamed the younger. The same may equally be affirmed of musicians. It may be answered that Mozart, and other great composers were the children of musical parents; — true, but we look in vain in their ancestral history for the marks of that genius, which enabled their children to express

"All thoughts, all passions, all delights,
Whatever stirs this mortal frame"

by the language of music. The mere sensuous gratification derived from harmony and melody, and which is experienced by the greater number, is far different from this.

But to return; —— a consideration of the influences of Education will account in many instances for the variations observed in the mental character of different generations, but it does not appear to me, that intellectual power or inferiority, (short of disease, or absolute defect,) is by any means so surely transmitted as physical - Dr Johnson has left it as his opinion, that "not one family in a hundred can expect a poet in a hundred generations"; and, surely, if we take any class of great men, as philosophers, poets, generals, statesmen, and the like, it is the exception to find marks of striking superiority or genius in their parents - The common mention of Pitt, as "the extraordinary son of an

extraordinary father" shews the unusual nature of the circumstance. That an active and energetic temperament shall be possessed by the parents of genius, is, I believe, more a matter of observation. (It must be recollected here, that I leave quite out of the question moral attributes, and confine myself to intellectual only.) I shall instance a few cases which may serve to illustrate my position. John Shakspere, the father of the poet, a glover and dealer in wool rose to the dignity of bailiff of Stratford; the title of "master" was prefixed to his name, and he obtained a grant of armorial bearings.

Wood represents Abraham Cowley's widowed mother, as struggling earnestly to secure him the advantages of a literary education.

Miltons father was a disinherited son, who, nevertheless, made a large fortune by practising the professions of a scrivener, and retired on his estate.

Popes father grew rich by trade &c. To these remarks it may be replied, that men of genius are by no means men of constant industry; although this be true, I believe it will be found, that those, whose works have delighted or astonished the world, have always at some season of their life applied themselves most energetically to their pursuit; and, that this application has been for the time so intense, that they have accomplished far more, than ordinary men arrive at; during a life time of toil. Who, whilst reading the life of Sir W. Scott, does not recognise the indomitable border spirit of his ancestors, enabling him to perform intellectual labours, from which few would not have shrunk, and nerving him at an advanced age to the attempt of retrieving his family's fortune by his unaided endeavours. I know not where we are to look for a more extraordinary instance of genius and energy combined, but the latter only was inherited.

those powers, which man possesses in common with the lower animals, will in their development or deficiency, be more the subjects of hereditary influence, than the higher mental qualifications; — thus, we find, courage and timidity frequently distinguishing families and tribes, the individuals of which shall differ much in amount of intellect.

To conclude, I believe that the hereditary manifestation of peculiar intellectual development is rare; although, the temperament, with which genius is usually combined, will be found to be frequently of ancestral derivation. This, appears to me, what might be expected from a consideration of the immateriality of the thinking part, which, we may believe to be in its nature incapable of transmission by any physical process, but is in each individual a fresh endowment from the Author of his Being.

Section 3.d

On the transmission of deformities, including deficiency and redundancy of parts.

In order to the more regular arrangement of the matter to be contained in this section, we shall consider it under three divisions.

1. Of Connate deformities of parents inherited by their descendants.
2. Of acquired deformities similarly transmitted.
3. Of deformities exhibited by children, which, although, not observable in their progenitors, are yet referible to causes acting on the parent organization.

1. Of Connate deformities of parents inherited by their descendants.

All writers on malformations have recognised the fact of their occasional transmission. The proofs of it are not unfrequent; we have already cited several cases in point, in the first section of this Thesis. The frequency of the occurrence has led some of the older authors to consider it as a necessary consequence, in cases where both parents exhibit a malformation. Thus Mons: Jean Palfyn, Chirurgeon of Ghent, in a curious book on Monsters, published in the year 1708, lays it down as a law, that if both parents are congenitally wanting in any part, their offspring must be equally deficient; "parce que", he says "ni le pere ne pourra pas fournir au Fétus cette partie de la semence spirituense qui doit former un tel membre, et que la mere ne lui communiquera pas la matiere necessaire pour la former."

Dr. Walton relates a case of a gentleman who had a bastard child laid to his charge. He was convinced of the paternity, when he found that the infant had six fingers on each hand, for he himself had possessed two small supernumerary fingers, which had been amputated in his infancy.

A great number of individuals in the family of Zerah Colburn, the American Calculating boy, had six fingers and six toes on each hand and foot; and this was known to have been transmitted through four successive generations. Haller and Dr Watson have both given cases of web-footed families, in which the peculiarity was transmitted. In Dr Watson's case through four generations. Dr Prichard has quoted several instances of six fingered families from Sir A. Carlisle, Reaumur and Maupertuis. In Reaumur's case the disposition in some of the members of the family only showed itself by an unusual thickness of the thumb; a daughter with a very thick thumb brought forth a son with the additional finger. Maupertuis traced the conformation in two families in Germany through several generations. It has also been noticed amongst the Negroes in the W Indies and America.

Dr Jas Coley in his treatise on Diseases of Children informs us that he has seen several instances of the inheritance of Club foot; and, Whitehead and others have made the same observation. Strabismus is frequently hereditary. The same may be observed with respect to other deformities, several are noticed in the first section, but enough has been adduced for illustration, and we may pass on to the second division; viz;

2. Of acquired deformities similarly transmitted.

That such cases occur we have sufficient proof, but at present they must be considered as exceptional, and at variance with the laws that usually prevails, although there can be no doubt that did we understand the circumstances of their production, they would be found to be as regular as any of the other operations of Nature. Some of the instances are very remarkable, I shall mention a few of them. I am acquainted

with a lady whose mother met with two accidents in her childhood, one, a fracture of a toe, which not having been properly set left it crooked and deformed for life, the other, a cut of the under lip extending downwards, which also caused a permanent scar; the daughter inherits most precisely both the deformities thus accidentally acquired by the mother. We are informed by Dr. Whitehead that "a father of three healthy and properly formed children, received an injury in a coal mine, in consequence of which he lost a limb. The next child which his wife bore had shortening and defective power in the corresponding limb." A case is on record of a man whose right Iris was nearly motionless and marked with a brown spot, from an injury in infancy, and this was the case with his eldest child. Burdach informs us that dogs whose tails were cut off had offspring with short tails.

3. Of deformities exhibited by children, which, although not observable in their progenitors, are yet referible to causes acting on the parent organization.

Under this head must be included deformities whose only assignable cause is an effect produced on the maternal imagination.

Note. I may here notice that since writing the first part of this Thesis I have met with a case somewhat analogous to Dr. Montgomery's. It is related by Dionis in his course of Chirurgical operations (Paris 1733). In speaking of congenital malformation of the feet, he says, "Whereas when the infant is ill shaped from its first formation, (as it happened to one of my relations, whose mother, when with child of him, look'd very earnestly at a beggar, whose foot was turned inwards, whence he was born with a foot like that of the beggar. We in vain tried all ways without being able to correct the

deformity &c)".

Morgagni, as before noticed, argues most strongly for the influence of maternal imagination in the production of deformity. He relates a number of curious cases in which this was the cause ascribed; amongst them is the following. "A woman heard of a little girl, whose right hand was entirely without fingers, the thumb not being in its proper place, and the places of the fingers being occupied by nails prefixed to the metacarpus: these things she thought of in herself very much and for a long time; and she at length brought forth a foetus, whose right hand was just in the same figure." Some of the other cases he adduces, whatever may be thought of them, are at least most curious.

One other instance may be mentioned, which occurred at the Manchester Lying in Hospital. A young woman, who had previously borne two healthy children, and was then in the 6th month of her pregnancy, was attracted by the screams of a child undergoing the operation for double hare-lip. On suddenly obtaining a full view of the deformity she fainted, and was carried out. She was delivered at the full time of a female child who had double hare-lip and cleft-palate, precisely as the one she had seen. Dr Little, in considering the causes of congenital club foot, is inclined to believe that a severe fright received by the mother, from any ordinary cause, is capable of inducing Talipes in the foetus. "Notwithstanding," he says, "that we are ignorant of the existence of any direct connexion between the nervous and sanguineous systems of the parent and those of the foetus, still, as violent mental impressions exercise so powerful an influence on the circulation of the parent, it is not improbable that sufficient derangement of that of the foetus may

be thereby produced, so as to injure the imperfectly developed and delicate brain and Spinal Cord of the infant, and thus produce imperfect development of other organs, and Spasmodic contraction of various muscles, which lead to different kinds of deformities". He, however, does not give credence to the opinion, that an infant is more likely to become affected from the Mother being disturbed by the sight of deformity, than from any other accidental cause of fright. It has been said, that a frequent cause of deformity, and especially of distortion of limbs, is an unequal pressure of the uterine parietes on the foetus - We may doubt if this be by any means a usual reason for such occurrences. It has been more generally alleged to account for cases of Talipes; these, however, are constantly observed where there is no paucity of Liquor Amnii, and deformity is by no means a certain concomitant of its deficiency. Distortions of the hands and feet have, also, been observed by Muller and Rudolphi in anencephalous and hemicephalous embryos of from three to five months, a period of uterine existence at which the relative proportion of fluid must oppose an effectual obstacle to the exercise of pressure upon any part of the foetus apart from the remainder. Blows on the abdomen, and other external violences offered to the mother, have been alleged as causes, but I am not aware of any instances which may bear such an explanation

The difficulty in tracing accurately the law of causation in these cases may be considered insurmountable; we are only made aware of their operation by beholding their effects, — when, the reason of the occurrence can only be a matter of surmise, which in but a few instances assumes the air of probability.

Section 4.

On the transmission of structural and functional diseases and morbid tendencies.

We may commence the present section by observing, that, tendency or proclivity to disease is more frequently transmitted than disease itself. Parents afflicted with Insanity, Rheumatism or Gout, shall procreate offspring, who are hereditarily predisposed to suffer from these diseases, but in whom they shall not shew themselves, until they are aroused by the application of an exciting cause. In other instances the disease itself may be strictly said to be hereditary, when, as in congenital Syphilis, the child labours under the disease from its birth. It may be supposed that equally in these cases something morbid is transmitted; although, in the former the principle lies dormant for a series of years, in the latter it is at once manifest.

Temperament, which all allow to be hereditary, frequently constitutes in itself a tendency to disease. By temperament here, I would be understood to imply, a predominance or defect of some function. Thus, in the Sanguine temperament, constituted by a general activity of the system circulating red blood, and a large proportion of red particles, and evinced in the excitable pulse, flushing cheek, quick movements and lively disposition, we have a predisposition to the various states of active hyperaemia, — inflammation, determination of blood, active hemorrhages and the like. In the bilious or melancholic, where there is a defective action of the biliary and chylopoietic viscera, we find a general tendency to derangement of these organs. In the phlegmatic or lymphatic temperament, characterised by weak pulse and languid circulation, cold extremities and pallid skin, clearly pointing to a deficiency of red blood and of vascular action and tone, we notice

a proclivity to watery fluxes, dropsy and other chronic affections; whilst, lastly, in the Nervous temperament, seeming to depend on an excess or want of proportion of some properties of the Nervous System, we find a decided predisposition to disorders called nervous, such as hysteria, nervous pains, spasms &c.

In prosecuting this subject I shall, for the sake of mere convenience, classify diseases subject to hereditary transmission in the following manner.

1. Of Hereditary transmission of Diseases of the General System.
2. Of Hereditary transmission of Diseases of the Nervous System.
3. Of Hereditary transmission of Diseases of the Organs of Circulation.
4. Of Hereditary transmission of Diseases of the Respiratory Organs.
5. I shall place together some other affections which strikingly exhibit the tendency in question.

1. On Diseases of the General System subject to hereditary transmission.

We observe on reviewing the history of Medical knowledge during the present and last centuries, that a great change has gradually taken place in the fundamental doctrines on which its superstructure rests. In no department is this more true than in that of Pathology. The humoral doctrines have again resumed their sway, no longer resting, however, merely on the sandy foundation of probable conjecture, or at best of ingenious theory, but on the more solid ground of observation and practical research; whilst their position is being made each day more secure by the characteristic diligence in investigation of the age. This resuscitation of the humoral pathology may, no doubt, be mainly

attributed to the application of Chemistry and the microscope in clinical and post-mortem research, together with the advancements made, through their instrumentality, in the sister science of Physiology; which latter have thrown so much light on morbid actions and processes - As the circulating fluid is the great reservoir of nutrition, whence all the constituents of the healthy body are derived, and from which a pabulum is supplied for the maintenance of the due activity of their vital properties; so it alone is the source whence diseased structures are nourished and increase, and defect or excess in the functional activity of organs and tissues are likewise dependant upon its purity and supply - Hence it is, that we find each day modern pathologists looking with increasing attention to the state of the blood as a cause of disease; and each year brings the record of their labours in the addition of some new fact to the accumulating evidence. The blood may be of improper quantity or vitiated quality. Its deficiency and excess have already been noticed as accompanying, and no doubt going far to constitute, peculiar temperaments - The tendencies to hyper-aemic and anaemic states are doubtless subjects of inheritance; yet from the influence exerted by external circumstances of diet, habitation, light, climate &c upon the function of sanguification, we can only state generally the hereditary tendency; as each particular case must be subject, from variation in these circumstances, to special modification - We find also, that various predispositions to, and states of cachaemia, are derived by offspring from their parents. / I may state here that I wish to be understood by cachaemia any improper condition in the quality of the blood, apart from anaemia or hyperaemia, which may cause or constitute disease; whether its

cause be the introduction of morbid germs, or the accumulation of non-eliminated excretion, or any unknown state of which we are only cognizant of the existence, but as yet are unacquainted with the nature.) The haemorrhagic diathesis has been observed occurring in different individuals of the same family. Some instances of its transmission are recorded so explicit as scarcely to leave the fact in doubt; and they are remarkable, further, from their seeming limitation to the male sex. The Gouty, Scrofulous, Rheumatic and Syphilitic diatheses, are all familiar examples of hereditary evil, whatever be the view taken of their constitutional cause as originally affecting the solids or fluids.

With regard to Scrofula a late writer, (Dr King), lays it down "that the direct hereditary principle is the grand source of the disease:" although this is probably too sweeping a generalization, yet, I believe that it will be found to be one of the most frequent. Different opinions have prevailed, however, on this subject; some having totally denied the doctrine; amongst the latter the most distinguished name is that of John Hunter, who, however, allowed the existence of an hereditary predisposition, but denied that Scrofula was ever a congenital disease - There can be no doubt that the predisposition merely, is by far more commonly transmitted; but yet Langstaff, Andral and several others have detected tuberculous depositions in the foetus; so that we may believe, that the disease as well as the predisposition, may be derived from the parent. On the other hand, we cannot but admit that Struma may originate "per se" in an individual; we find that alterations in climate &c are sufficient to induce it in the lower animals, / Tuberculous depositions are a frequent

cause of the death of Monkeys and Carnivora in our Zoological Gardens,) and we cannot doubt that depressing influences of various kinds acting upon the human body will have a similar effect. "When Scrofula is hereditary," Dr. Holland remarks, "that there appears a general tendency to the same forms in the same branch of a family thus affected; still more so in children of the same parents. I may mention, (he says) as a striking example, the number of cases of blindness, partial or complete, in some families where this temperament exists. In others, the disposition is as strongly marked to affections of the joints; — in others, again, to pulmonary consumption in its more common form". The question as to the transmission of phthisis will be discussed hereafter, but I may observe, that writers on the hereditary nature of Scrofula, have generally included Phthisis in their consideration. Some have attributed the origin of Scrofula to impregnation taking place during the menstrual period, or to accidents during gestation, these views, however, are supported by no solid arguments. Several writers consider it as an established fact, that very late and very early marriages are productive of Scrofula. At least, most allow that in the generality of such cases the children are not so robust as those who are the result of better timed unions; and this debility renders them easily affected by the action of the depressing causes, which, as we have before noticed, are capable of originating the disease. Dr. King, as the result of his observations, considers that parents having exhibited symptoms of Struma in their youth and Childhood, but who have apparently overcome the disease, and are to all appearances robust, will, nevertheless, transmit the taint to their children. Much

discussion has taken place on the subject of the syphilitic origin of Scrofula. Portal, Astruc, Hufeland, Richerand and Alibert, have all advocated the doctrine that the strumous constitution is a state of degenerated Syphilis. They rest their opinion chiefly on the similarity of certain symptoms. That the two diseases are identical, (notwithstanding the above high authorities), we can hardly credit, for the following reasons. 1. Scrofula was well known in Europe long anterior to the introduction of Syphilis. 2. The very remedy which is of most service in Syphilis is most inapplicable in the treatment of Scrofula. 3. According to the experience of Baudelocque, children born of mothers infected with Syphilis, are not more prone to Scrofula than when this is not the case. 4. Children of syphilitic parents are born with the disease upon them. M. Ricord is of opinion "that parents suffering from tertiary Syphilis are incapable of transmitting it to their offspring, who however, exhibit Scrofula;" but it by no means follows that the two diseases are connected together as cause and effect. When it is recollected that tertiary Syphilis is generally observed in broken down constitutions, whose vital energies have been sapped by various excesses, the undue use of Mercury &c., we cannot be surprised that the offspring of such persons should be weakly, delicate, and susceptible of every depressing influence; and, thus predisposed, under the exciting influences of bad diet, situation and atmosphere, in them Scrofula makes its appearance.

There are few doctrines founded on a surer basis than that of the hereditary transmission of gout. "The experience of physicians in every age," says Dr. Gairdner, "in fact, the common observation of all mankind has sufficiently established the fact of the hereditary nature of gout. It does not always descend from father to son in uninterrupted succession, but will often pass over a generation or

two, though freely exposed to its exciting causes. It rarely, however, fails to resume its dominion even in a third or fourth generation." Again, Dr. Todd, in his work on Gout and Rheumatism, adduces its hereditary nature in proof of its being a blood disease. "It has been argued by some," he says, "that the hereditary transmission of Gout is strongly in favour of its being a disease of the solids, I am entirely at a loss to discover a single sound argument in support of this opinion. Indeed it is opposed by the analogy of all diseases known to be hereditary, for in all of them the blood is contaminated either primarily or secondarily, as in phthisis, diabetes, cancer, the haemorrhagic diathesis. The generative act is in its essence one of secretion; the Embryo being the result of the combination of two secretions, the one formed by the Mother, the other by the father. These secretions are composed of matter separated from the blood of each parent respectively, and it is obvious that the body which results from the union of both, must partake of the properties and characters of both. And thus it is that we meet with children combining in equal proportions, the qualities of both parents, while in others those of the father or mother predominate, as if the peculiar properties of the matter derived from one parent were such as to neutralize those from the other." We must not, however, suppose that Gout is only to be observed descending from parent to offspring. There is no doubt but that like Scrofula it is capable of being acquired. We may therefore critically object to Dr Cullens strict definition of "morbus hae-reditarius." Dr C. Scudamore has collected a number of cases with a view to establishing the proportion between hereditary and acquired gout. The following is his table;

Hereditary from the father was, ——— 101.
——— Mother, ——— 59.
——— father & mother, ——— 24.
——— grandfather on each side, ——— 3.
——— grandfather on one side, ——— 37.
Of those whose grandmother only had gout, ——— 3.
——— grandfather & grandmother, ——— 1.
——— Uncle only in the family had gout, ——— 21.
——— Aunt only in the family had gout, ——— 3.
Not known either on the father's or mother's side ——— 190.

522

From this statement it appears, that the cases of acquired gout, in which no family reference could be traced, were to the rest as 190 to 332; and in the examples contrasted with those immediately hereditary as 258 to 264. From the above table we must be struck with the vast influence of hereditary predispositions, especially when we recollect, that even in that class of life in which gout is most frequent, gouty persons are a small minority; the numbers of 190 to 332 then appear in strong contrast. We must also remember that the liability to error is in making the acquired cases too numerous, from the frequent difficulty of obtaining proof of hereditary predisposition, where the fact exists. It appears, also, from Sir C. Scudamore's researches, that gout is liable to appear earlier in hereditary cases than in those in which it is acquired. Illustrative of this he gives the following table;

In Men acquired,

Before the 20th. year	5.
Beginning between the 20th & 30th year	30.
Beginning between the 30th & 40th year	47.
	82.

In Men hereditary either from Father or Mother

Before the 20th year	8.
Beginning between the 20th & 30th	50.
Beginning between the 30th & 40th	50.
	108.

In Women acquired,

Before the 20th year	1.
Between 20 & 30	4.
Between 30 & 40	3.
	8.

In Women hereditary either from Father or Mother

Before the 20th year	2.
Between 20 & 30	6.
Between 30 & 40	8.
	16.

Sir C. Scudamore remarks that he has, in two or three instances, distinctly found the personal resemblance to the gouty parent to be much stronger in the gouty child than in any of the other children. He also further states, that "when both parents have gout, we may expect the disposition to the

disease to be manifest in several of the children"; and he says that he has met with no exception to the fact. Dr. Garrod, who from his researches on this disease believes it partly to depend upon a loss of power in the "uric acid excreting function" of the kidney, considers this as explaining in some degree its hereditary nature, for he thinks that we can readily understand, that a peculiarity of the kidney with reference to the excretion of uric acid may be so transmitted.

In the case of Rheumatism, although, as far as I am aware, the fact has not been so carefully traced as in Gout, it is yet allowed by most authors to be a disease of an hereditary kind, though, probably it is more dependant than Gout on the application of exciting causes from without. Dr. Todd, quoting from Chomel, states that of seventy two patients questioned relative to this point, thirty-six were born of parents who had been rheumatic. He also considers that children of gouty parents are more subject to this disease than those who have sprung from an untainted source.

The question of the hereditary transmission of the cancerous diathesis has, hitherto, I believe, been affirmed from theory, rather than proved by facts. Dr. Walshe, in his work on Cancer, states that he has met with several cases in which his conviction of such origin was as complete as it could be independantly of absolute proof. Dr. Warren, in his surgical observations on Tumours, relates the following remarkable case. "The grandfather died of a cancer of the lip; whether others of his generation were affected I know not. The son had a cancer of the breast, and at the age of sixty was operated on by my late father, but died of cancer some years after. Two of his sisters had cancer of the breast, were operated on and ultimately died of the disease.

A daughter of one of the ladies had a cancer of the breast but declines any operation. I have reason to believe that other members of the family are affected, and conceal the existence of the disease". Dr Holland considers it certain that the Carcinomatous habit is an hereditary one, although, from the comparative infrequency of the disorder, the proofs are limited.

There are few facts more constantly under the notice of the Medical practitioner, than that of the transmission of the syphilitic taint, although there is much difference of opinion as to the particular laws by which the transmision is regulated. The following is the opinion of M. Ricord, whose extensive experience places him in the foremost rank amongst writers on this subject. "As long as an infected father is under the influence of Constitutional Syphilis, the germ which is by him conveyed into the uterus carries along with it the Syphilitic diathesis; and it must be noticed that evident manifestations upon the father are not absolutely necessary; — the diathesis is quite enough to produce upon the offspring the effect I have mentioned. When the secondary period is passed and the tertiary manifestations begin to appear, the disease is no longer transmissable; the children are then born with another disposition, viz the Scrofulous; and the tertiary symptoms of the mother have the same influence on the child as those of the father." He also is of opinion that a father suffering from secondary syphilis cannot infect the mother and through her the child; but that the husband procreates an infected child which may then propagate the secondary poison to the mother; for where there are no children the mother does not suffer. "Suppose "he continues," the mother to conceive whilst herself and the father are quite free from the syphilitic diathesis, and that this diathesis

subsequently happens to arise in the father, can it be transmitted to the child? I do not hesitate in answering the question in the negative, and I must look upon that opinion as very absurd, which supposes that the father can contaminate the foetus through the membranes. In order that a child, the offspring of healthy parents, should be at all infected, after it has existed more or less time in utero, the mother must by direct inoculation, become affected with an indurated chancre and all its consequences, then the foetus may inherit the diathesis of the mother." It is also quite possible, that a child may be infected by direct contagion on its passage through the vagina, if the mother have any primary inoculable sores. The doctrine that a father suffering from secondary symptoms is incapable of directly transmitting the disease to the mother except through the medium of the foetus meets with strong opposition from Dr. Whitehead and others. This question, however, is foreign to our subject, I shall content myself with observing that the histories of syphilitic patients as given by themselves, should be received with great caution by medical men. The ignorance of such persons of the nature of their complaints, and the number of reasons which may arise for concealing and disguising the truth, diminish much the value of their accounts. Dr. Whitehead's work has been censured by Reviewers for the numerous cases in which he seems to have guarded but slightly against this and other sources of error. It is generally admitted that the syphilitic taint is one cause of abortion, death of the foetus and premature labour. Cases in proof of this are recorded by Drs. Beatty, Colles, and Campbell. Mr. Acton, however, will not admit that syphilis is by any means so frequent a cause of these occurrences as is supposed by the latter writer. He says "Venereal female hospital patients

in spite of all moral and physical impression frequently carry their children to the full period, and at the time of birth, we meet with the infant quite healthy, or only sickening some weeks after. Such being the natural course of syphilis, when observed on a large scale, I have hesitated in concluding that syphilis produces abortion at the 7th month, or that the circumstance of a child being born dead or putrid is of itself of any value in the diagnosis".

To sum up, the following appear to be the facts which are generally admitted.

1st If one or both parents are suffering at the time of conception from constitutional syphilis, the offspring is liable to be similarly affected.

2nd It is not necessary that at the particular time there should be any manifest signs of disease upon the parent; the possession of the diathesis is sufficient.

3rd It seems from M. Ricord's experience that tertiary syphilis is not transmissable.

4th The poison may be virulent enough to produce the death of the foetus in utero, and to induce its premature expulsion.

In speaking of hereditary scrofula we have noticed its alleged syphilitic origin, and in what way a connection may be supposed between tertiary symptoms in the parent and scrofula in the offspring.

Many cases prove that the foetus in utero is capable of receiving the contagion of small pox. In some of these cases the parent resisted the effects of the morbid poison herself. In a case mentioned by Dr Jenner, she experienced no indisposition; in another, recorded by Dr C. Gnoli, a woman, who had been previously vaccinated brought forth an eight months child in a comatose state, and covered with small pox pustules.

She stated that about a week before delivery she felt generally ill, was feverish, lost her appetite, and suffered much from heat in the stomach, but not so severe as to make her seek for medical advice.

Before leaving the subject of hereditary transmission of general disease, I cannot but notice the tendency we frequently observe in the members of the same family to be similarly affected by any given disease. This is, generally, most remarkable during their infancy and childhood, when we may believe the constitution to be but little altered by extraneous influences. In the case of twins particularly this often holds good. Dr Holland says, that he has known some very curious instances where two children of a family, with the strongest resemblance in features, form, and habits, have shewn a singular likeness in the symptoms of the disorders affecting them, and in their idiosyncrasies as to particular remedies. Every practitioner must recollect instances of hooping cough, the Exanthemata and febrile diseases generally, attacking the different children of a family in a similar manner, running a parallel course, and associated with the same complications.

We now pass on to consider,

2. Hereditary transmission of Diseases of the Nervous system.

In no class of disorders do we find the hereditary principle more developed than in that comprehending diseases of the Brain & Nervous System. We find these affections, from simple head-ache to the worst forms of epilepsy and palsy, transmitted from generation to generation; whilst, in that most awful disease to which any reasonable being can be subject, insanity, we observe only too many proofs of a similar tendency. I shall notice in succession some of these diseases in which hereditary transmission

has been most uniformly affirmed.

Cephalalgia. Many writers have recorded their opinion that headache is hereditary. Among these are Georget, Calmeil and Holland. The latter considers that in different cases the cause of the headache may be different. Thus in some, especially where periodical, it may depend on the gouty diathesis; in others, on some anormal structure of the vessels of the head; in others, on some peculiarity in the nervous substance itself; all of which causes he believes may be inherited. I am not aware of any very accurate observations on this particular subject, but cases frequently occur of neuralgic pains generally, in which an hereditary tendency may be supposed.

Hydrocephalus. This disease, whose inflammatory and scrofulous elements have been so ably set forth by Dr West in his lectures on Diseases of Children, may be frequently traced to a predisposition derived from the parents. The doctrine of its hereditary origin has been strongly advocated by continental writers, amongst whom Gölis may be mentioned as a high authority. The common occurrence of hydrocephalus in more than one child of the same family is a matter of constant observation. Underwood mentions one family, in which six children died of this disease at the age of two years; five of whom were examined after death. Cheyne gives a case in which ten children in one family died of the same affection. Dr Adams relates an instance of a family of several children, in which there was a similar disposition. Three were seized before the age of puberty, and the disease proved rapidly fatal. Those who escaped up to that age continued free from the complaint. But the remarkable part of the case was, that the mother was able from similarity

in features and character to prognosticate correctly which of the children would be seized. Gölis goes so far as to say, that great terror and distress of mind in the mother, during the latter months of pregnancy, may lead to the occurrence of acute hydrocephalus in the child; and he brings forward this curious fact in support of his opinion; — a large proportion of the children that were born at Vienna, soon after the bombardment of that city by the French, in 1809, were seized with convulsions within a month after their birth, and died of inflammation within the cranium; effusion of coagulable lymph between the membranes, and of serum in the ventricles being discovered on dissection.

Portal, and many writers since him, have acknowledged the hereditary as one of the strongest predisposing causes of Apoplexy; and of course its influence will be greatly enhanced when it is combined with an hereditary apoplectic conformation of body. The constant successions of Apoplexies that we observe occurring in the same family permits of no other explanation.

Epilepsy is another disease in which the same tendency is observed. Bouchet and Casauvielh found that among 110 instances of Epilepsy 31 were hereditary. Of 321 persons afflicted with epileptic insanity, and seen by Esquirol 105 were descended from insane or epileptic parents. The latter physician believes, that this disease is more commonly transmitted by the father than the mother; the reverse of what he supposes to take place in insanity.

Dr Holland relates a case in which paralysis agitans went through at least 3 generations, attacking young persons of 16 or 18, as well as those more advanced in life.

Without stopping to enquire whether Insanity be really a disease

of the brain, or whether, according to the views advocated by Dr. James Sheppard and others, its proximate cause is to be looked for in a morbid state of the blood, I may plead common use in placing it in this category of affections. In prosecuting the study of this disease we are continually met by convincing proofs of its hereditary tendency. "In the reports of Hospitals for the insane in France," says Dr. Prichard, in his article on Insanity in the Library of Medicine, "the cases which are attributed to hereditary predisposition bear a considerable proportion to the entire number of admissions. In a report drawn up by M. Esquirol of admissions into the Salpêtrière in 361 cases the disease was traced to various physical causes; in 105 it was ascribed to hereditary predisposition. In M. Esquirol's private establishment, where only the better class of patients are received, the last mentioned class amounts to 150 while all the other moral causes are stated at 120. In a similar report from the Maison Royal de Charenton, in 256 the disease was produced by physical causes, of which 93 come under the head of hereditary predisposition; and in 150 by moral causes. This may suffice," Dr. Prichard continues, "for the present to furnish some idea of the proportional numbers, but it cannot be considered that the extent of this physical influence has been ascertained. The information obtained at the admission of patients from the lower orders of society is often imperfect, and it is probably to be ascribed to this circumstance that the proportion of hereditary cases is so much greater in the returns from M. Esquirol's private establishment, than it is at the Salpêtrière, or even at Charenton." In the 11th Annual Report of the Hospital for Consumption in comparing the hereditary nature of phthisis with that of other diseases, I find it

stated that Insanity is hereditary in nearly 12 per cent of the male cases observed; in 13.5 per cent of the Females. These proportions, as it will be seen, are much smaller than those quoted by Dr Prichard. At Charenton of 256 cases produced by physical causes, and 150 by moral, making a total of 406 - 93 were traced to hereditary predisposition, or about 23 per cent:)

It is worthy of notice that both in Insanity and Phthisis, it has been found that the father is more likely to transmit the morbid tendency to the sons, the mother to the daughters. The following tables illustrate this fact:

Insanity

	No. of Cases.	Father insane.	per cent.	Mother insane.	per cent.
Sons.	117.	64.	54.6.	53.	45.3.
Daughters.	147.	67.	45.4.	80.	54.4.

Phthisis

	No: of Cases	Father Consumptive	per. cent.	Mother Consumptive.	per cent.
Sons.	106.	63.	59.4.	43.	40.6
Daughters.	108.	47.	40.5.	61.	56.5

Baron Von Feuchtersleben, in his medical psychology, speaking of the pathology of mental disease, says; "Hereditary descent is unquestionably the most frequent predisposing cause, for it predetermines a decided type of personality as the basis of its diseases. More than half of all the cases that occur are favored or occasioned by it. Marriages in the same family, therefore, contribute to the propagation of this germ. It often takes place uninterruptedly from the father to the son, from the son to the grandson; often with an interruption from the grandfather to the grandson;

often irregularly to the nephews &c. The danger is less when the procreator does not become insane till after the procreation, and therefore had previously only a predisposition. The tendency manifests itself on the psychical side, 1st By passiveness in thinking, in feeling, and in willing; on the physical side, 2nd by predominant erethistic vital debility, the fundamental character of the present generation. Such a state is peculiar to nervous individuals. We have here, however, especially, to take into account certain constitutional diatheses on the corporeal side. They are, (a) the Scrofulous and Rachitic habitus, in which the above mentioned state occurs; (b) the Apoplectic, which disposes to certain forms of insanity (especially mania) in consequence of the hyperæmia of the brain; (c) the Venous (otherwise atrabiliary), which also disposes to certain forms, with a tinge of melancholy in consequence of the impeded ganglionic conduction." Dr. J. Sheppard accounts for this transmission of mental disease, by his theory of its proximate cause; which is, that it is dependant on some morbid state of the circulating fluid, and that it, therefore, has the same tendency to transmission which we observe in other blood diseases.

It is a singular circumstance, and one worthy of being mentioned, that in families predisposed to insanity, there appears to exist a susceptibility to obliteration of one or other of the sensorial functions. Thus, in the offspring of demented parents, — one or other being affected, — one child may be born deaf or blind, or otherwise defective, and this child will retain the mental faculties in a state of integrity, and even of vigour; while some of the others, perfect in these respects, have inherited weakness of intellect.

Before I leave this part of the subject, I must notice a theory, which has lately been advanced by Dr. Moreau de Tours, Physician to the Bicêtre Hospital at Paris, an account of which is to be found in the first volume of the Lancet for 1852 (p. 12). He considers that the organization of the parent is handed down to the offspring by the transmission of two great series or organs, the one including the external form and configuration, the other regulating the nervous functions: and that when one parent communicates one series, the second parent transmits the other. He asserts that where hereditary similarity to one of the parents has been made manifest by insanity, likeness in external feature and configuration will not fail to be transmitted by the other. This assertion he supports by 164 cases in a given number of 192. He, therefore, considers as demonstrated;

1st. That the law of hereditary transmission according to series of organs is founded upon truth, within certain limits.

2nd. That the transmission of cerebral disturbance and of physical likeness may be effected by either parent, more frequently by one only.

3rd. That a family being given, among whose stock there have been one or more individuals affected with Insanity, it is very probable that the hereditary disease will settle in preference upon such of the children who have little or no physical likeness with the relatives in whom the disease has originated; but that the mental affection will, on the contrary, not affect that portion of the offspring who bear to those relatives a more or less striking physical resemblance.

This ingenious theory is certainly contrary to the law generally laid down, that predisposition to any hereditary disease is strongest in

the child which most strongly resembles the diseased parent. Admitting, moreover, M. Moreau's observations, we do not see that the truth of the theory of the transmission of separate series of organs by each parent, follows of necessity. At the same time should further investigation prove his assertion true in the large proportion of cases, there can be no doubt but that the knowledge of the fact may be turned to practical account.

3. On the Hereditary transmission of Diseases of the organs of Circulation.

We find scattered up and down the writings of physicians, cases in proof of the occasional hereditary nature of heart diseases, although, I am not aware of any attempt to determine the ratio which this may bear to the other causes generally acknowledged. The Rheumatic origin of one great class of Cardiac disorders would lead us of itself to the belief, that these affections, with the cause producing them, are capable of being conveyed from parent to children. But it is not only in this class that we find cases recorded of hereditary transmission, Hypertrophy, Dilatation and Ossification, have each been observed to descend from generation to generation. This tendency did not escape the notice of some of the older physicians - Thus we find Lancisi, in his treatise on Aneurisms, devoting a section to the consideration of, "Hereditary disposition to Aneurism of the Heart," where, he mentions the case of a noble family, in which four generations, namely, the great grandfather, grandfather, father & son, were successively affected by a very severe form of this disease. Albertini mentions a case, in which five brothers and their sister fell victims to heart disease;

and Dr. Holland says, that he was acquainted with an instance in which four brothers died between sixty and sixty-five of ossification and other disease of the heart, and there appear to have been prior cases of the same kind in the family.

Dr. Adams says that he knew three brothers attacked with Angina Pectoris, each as he arrived at the age of about 18; to all it proved fatal in a few months; those of the children who grew up to manhood escaped the disease

These cases will suffice for illustration of the occasional hereditary tendency of cardiac affections; numerous other instances might, doubtless, be advanced; but the limits of this Thesis must prevent their introduction.

b. On the Hereditary transmission of Diseases of the Respiratory Organs.

Of this class of affections, the one in which the principle under consideration has been most generally recognised, is phthisis; but within the last few years doubts have arisen with some, as to the propriety of ascribing consumption, in anything like a large proportion of cases, to a morbid tendency derived from ancestors; and at the present time, the question is by no means a decided one, even amongst those who are best qualified to judge of it. Drs Watson and Williams have both asserted hereditary tendency to be a powerful cause of the disease; the latter says it may be considered, "one of its most fertile sources." Sir James Clarke has expressed a similar opinion, and he considers, on account of debility from disease or age in the parents, that it is transmitted more often to the younger than to the elder children of

a consumptive family. Louis, although he does not express himself so decisively on the subject, yet states, that a tenth of the subjects who fell under his observation were born of parents, either father or mother, who according to all appearances had died of phthisis; at the same time, he allows, that this proportion is probably below the truth, from the impossibility of ascertaining from hospital patients, the nature of the affection to which their parents fell victims. M. Briquet, in an Essay on the Etiology of Phthisis (whose results, however, M. Louis is inclined to doubt, from his belief that sufficient care was not employed in obtaining them) states, that of 67 male phthisical patients, 37 were born of healthy or non-tuberculous parents, 24 of phthisical parents, 6 of parents the condition of whose health was not ascertained; and that of 32 phthisical females, 14 were born of non-tuberculous parents; 12 of phthisical parents, 5 of parents whose state of health could not be ascertained.

M. Louis doubts the capability, of so large a proportion of hospital patients, to give accurate information as to the disease of which their parents died. He accordingly finds that of 31 phthisical patients who were carefully interrogated, 3 sprang from parents who were obviously phthisical, 12 from parents who were not phthisical, 16 from parents, the nature of whose disease could not be determined. In the first annual Report of the Hospital for Consumption and diseases of the Chest, this subject is investigated, and the following table exhibits the results;

Sex.	Cases of Consumption.	Predisposed by Disease in Parent.	Per Cent.
Males	669	122	18.2.
Females	341	124	36.3
Total	1010	246	24.4

From this table we find, that daughters are more liable to inherit consumptive disease from parents, in the proportion of two to one. As to the relative influence of the father and mother, it has been found that the father transmits consumptive disease to the sons in 59.4 per cent, to the daughters in only 43.5 per cent. The mother to the sons in 40.6 per cent; but to the daughters in 56.5 per cent.

We may, I think, draw from these facts, that at least in a considerable proportion of cases, this disease is caused or favored by hereditary tendency, and, although difference of opinion may exist as to the proportion of cases, there can be no doubt as to the fact.

The limits of this thesis will not permit my pursuing this part of the subject further; I must, therefore, content myself with noticing that several other diseases of the respiratory apparatus have a similar tendency to be favored by hereditary causes; amongst these, I may mention, Spasmodic Asthma, true Croup, and Laryngismus Stridulus; and, lastly, Dr. Jackson of Boston in America, has proved the frequency with which Emphysema of the lungs may be attributed to the same cause.

5. On a similar tendency observed in various other affections.

In the production of several diseases of the chylopoietic viscera, we see the effect of congenital predisposition. Members of the same family are often observed to be similarly disposed to suffer from dyspepsia, gastrodynia, costiveness &c. Tuberculous disease of the mesenteric glands and alimentary canal is, in many instances, favored in its development by the same cause; and if we allow Dr. Todds' view of the pathology of

Diabetes Mellitus to be correct, viz. that it is "primarily a disease of the mucous membrane of the stomach, whereby an abnormal diastase is formed which rapidly converts into sugar such aliments as admit of that conversion," it must be added to the category of hereditary diseases of the Chylopoietic viscera. In support of the assertion of its hereditary nature, the following cases may be quoted - In the instance of one of Dr. Prout's patients four near relatives had suffered from the disease - Dr. Christison gives an instance in which a father and two of his family were affected, and there was reason to believe that one, probably two individuals amongst the parents and grandparents had suffered from the same cause. Dr. Holland says he has known three cases of Diabetes Mellitus in brothers under 10 years of age in the same family, one of them proved fatal. In the former part of this Thesis, I have alluded to a case in which the disease was confined to the female branches -

We occasionally find tendencies to enlargement of the tonsils, quinsey's, and bronchoceles distinguishing certain families. Drs Adams & Holland are both of an opinion, that an hereditary morbid tendency is one of the causes of the goitre and Cretinism of Switzerland; and of the frequency of some other diseases in certain localities, which have been, hitherto, ascribed to soil, climate, altitude, water &c.

The appearance of the different kinds of gravel in the urine is well known to be in some cases hereditary - Dr. Christison asserts this in his treatise on gravel in the Library of Medicine - We are quite prepared for this fact, when we recollect, its frequent connection with gout and scaly cutaneous diseases. Again, a similar tendency to some forms of urinary Calculi is found to be referible to the same cause - This has been observed, amongst others,

by Mr Ferreira, a Sicilian Surgeon, (quoted by Dr Adams), who noticed the fact amongst the Sicilian nobility, which class, to preserve the purity of their blood, continually intermarried, each in their own family.

Tendencies to rachitis, diseases of dentition, caries of the teeth, a proclivity to dropsy, cataract, deafness, a disposition to the formation of abscess, hydrocele, have all been observed to follow a similar law.

I must conclude this section by noticing a few of the skin diseases proved to be hereditary.

1. Erysipelas. Dr Whitehead states that he is intimately acquainted with a family wherein this disease has prevailed under widely varying circumstances, in four generations. The paternal ancestor died at 73 of Angina pectoris. He had been remarkably healthy through life with the exception of periodical attacks of erysipelas of slight character, implicating the face and hands. His son, a medical man now living at the age of 74, has for the last 30 years suffered from a similar affection, which has on several occasions assumed a threatening aspect. One of his sons died at the age of 27 from erysipelas of the face and head, which terminated on the 5th day in cerebral effusion. Another son has repeatedly suffered in like manner, any slight scratch or wound of the skin, being attended with inflammation of the surrounding surface to a considerable extent. A daughter of this father has had repeated attacks of the same troublesome affection in the lower extremities, which on several occasions has become phlegmonous, terminating in ulceration of an intractable character. So long as these ulcers remained open the general health was in a tolerable condition; but being healed, the powers of the system faltered, and sooner or later another attack of Erysipelas supervened,

which almost invariably ended in like manner. Another daughter, 40 years of age, who has hitherto escaped the disease altogether, was married to a man, who died at the age of twenty-nine of tubercular phthisis. Two sons were the issue of this union, one of them being remarkably like the mother's family in constitution, the other inheriting all the physical traits of his father. The first at the age of 18 had a most violent attack of erysipelas of the forehead, coming on without assignable cause, and which ended fatally by cerebral effusion on the third day. Other writers have noticed a similar conveyance of this diathesis.

2. Certain impetiginous eruptions belong to a family constitution, such as is often termed scorbutic, and is obviously transmitted from parent to children.

3. Certain forms of Acne, especially that termed "acne rosacea", appear liable to a similar transmission.

4. Sycosis or Mentagra, is acknowledged to be an hereditary disease. As before stated, it is popularly believed that this attacks males and females in alternate generations. Dr. Whitehead, (who, however, is inclined to believe in the syphilitic origin of sycosis,) has shewn that this is not an invariable rule, and has given the details of a case in which no such law of transmission was observed.

5. Psoriasis. This disease is capable of transmission frequently in families in which the gouty habit is observed. Dr. Holland mentions a family in which there was a strong predisposition to gout, three of the children suffered from psoriasis.

6. Ichthyosis is frequently hereditary, and its appearance, as before noticed, has been observed in some cases to be confined to the male sex.

7. The Pellagra of Lombardy, as described by Dr. Holland, is a disease of an hereditary nature.

8. Lepra Tuberculosa or Greek Elephantiasis, is a disease of a similar tendency, although it appears not necessarily so. The Sicilian surgeon before mentioned, assured Dr. Adams that in one noble Sicilian family, in which Elephantiasis was hereditary, an alliance with any other was disdained, on account of their own elevated rank.

I shall conclude this section with two general observations.

1. That several children of a family may be affected in common with some given malady, of which there has been no token on the side of either parent. Of this many instance might be given from various writers. Some of these may perhaps be referred to the revival of an hereditary disorder absent in one or more generations; but proof to this effect is wanting in others.

2dly That many hereditary diseases have a well marked tendency to evolve themselves at particular periods of life, differing for each. And this is found to hold good, not only with many diseases of the general system, as gout, scrofula &c., but with disorders of particular organs, as the heart and brain.

Section 5.

On the circumstances and influences by which hereditary tendencies may be modified.

I shall not prolong this thesis, by dwelling long on this head, important though it be to the medical man, who is so frequently called on to obviate the effects of morbid predisposition. I have before noticed that a tendency to disease is much more frequent than an hereditary affection, and it is this that the physician has most frequently to combat, at least it is this which is more generally to be overcome by his endeavours. In the treatment of morbid predispositions, we should ever remember, that by a fixed law, Nature is constantly making an effort to correct deviations, and to return to the natural standard. It must be our endeavour to assist her by removing all the causes of mischief, thus leaving her at liberty to pursue her restorative process. In the case of a morbid poison we must, where possible, administer such remedies as have a counteractive influence. In other cases by attention to the nourishment, air, clothing, education of children, we must try to avoid all fresh impulses in a wrong direction. Unhealthy tendencies are frequently brought into action at a particular age in different families. At such times their possessors should be under peculiar care, every source of morbid irritation should be removed, every spark by which the dreaded fire may be kindled should be instantly extinguished. Other tendencies seem to be generated and kept up by climate; this must be changed and our patients removed to a more healthful air and soil. Those, who suspect themselves to be the subjects of any morbid disposition,

should certainly avoid matrimonial connection with others labouring under the same circumstances, as it is well known, that children are doubly predisposed when both parents transmit the tendency.

I have thus (very imperfectly I am aware,) endeavoured to bring together the principal facts, which were within my reach, on this subject. Although the performance has been most defective, yet I trust allowances will be made for its deficiencies, both in consideration of the magnitude of the subject, and the inexperience of the Compiler.

Finis.