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OF

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तदेव युक्तं भैषज्यं यदारोग्याय कल्पते।
सचैव भिषजां श्रेष्ठो रोगेभ्यो यः प्रमोचयेत्॥
चरकसंहिता।

That alone is the right medicine which can remove disease:
He alone is the true physician who can restore health.
Charaka Sanhitá.

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RAT AND PLAGUE.

It is generally accepted that rats communicate plague to man. How far the theory is true remains to be observed. To join with the common cry is not reasonable without a careful examination of the facts that are placed before us. The acknowledged truth is that rats are liable to be attacked with plague. Many other animals as pigs, monkeys, etc., share the same fate. Before entering into the whole question, we should know the different varieties of rats and their idiosyncracy for the attack.

The term rat is popularly applied to many murines. Specifically, it designates two varieties. "1. The English Black Rat (*Mus rattus*), and the Brown, or Norway Rat (*M. decumanus*). The former is a small, lightly built animal, about seven inches long, with a slender head, large ears, and a thin scaly tail, longer than the body. In temperate climates the colour is a bluish-black, lighter on the belly. This species is represented in warmer climates by the Alexandrian Rat (*M. Alexandrinus*, Geoff., better known as *M. rattus rufescens*), with a gray or reddish back, and white under-surface. By later naturalists it

is considered as only a variety. The albino and pied rats, kept as pets, also belong to this species, which had its home in India and penetrated thence to almost every part of the world, driving out the native rats, and to be in its turn, exterminated by the Brown Rat (probably a native of China, where a similar species, *M. humiliatus*, is still found). The Brown Rat is much more heavily built than the Black Rat, grayish-brown above and white beneath; ears, feet, and tail flesh-coloured. Melanism often occurs, but such animals may be readily distinguished by ordinary specific differences from the true Black Rat. Length of head and body eight or nine inches long, tail shorter. Both the species are omnivorous, predacious, and extremely fecund, breeding four or five times in the year, the female producing from four to ten blind, naked young, which breed in their turn at about six months old. *M. fuscipes* is the Brown-footed Rat of Australia; *Nesokia bandicota*, the Bandicott, or Pig-rat, and *N. bengalensis* the Indian field Rat."

We know of the class Nesokia from Agassiz. It is a "murine genus closely allied to Mus. It contains five or six species of clumsily-built rats spread over southern Asia, from Palestine to Formosa, and from Cashmere to Ceylon."

Leaving aside the character of the *Nesokia bengaleusis*, which resembles more with the Brown Rat than the Black, difference of opinion is observed with regard to the theory of destruction of the Black Rat by the Brown. The writer in the Encyclopædia Britannica, substantially agrees with the above description. There is an interest in the theory of the displacement of the Black Rat by the Brown. It is said that the cause of the disappearance of plague from Europe is due to the partial extermination of the Black Rat. On this notion, the destruction of the whole species of rats rests for practical use. The fact can not be denied that Black Rats still exist in Europe. Some persons in Germany assert that *Mus rattus* or the Black Rat is reasserting its predominance. The writer in the Encylopœdia Britannica denies this assertion. Be this as it may, the fact remains that there are the Black Rats in Europe and still plague has almost

disappeared from the whole tract of the land. The insignificant attack of plague is not even in proportion to the existence of the Black Rat. The theory of the Black Rat communicating plague to man becomes questionable.

On the other hand we observe that in China there is the largest preponderance of the Brown Rat and plague. The species in that country "is believed to be a native of western China, where a wild race has been recently discovered so like it as to be practically indistinguishable." Thus the theory of the dissemination of plague by the Black Rat alone falls to the ground.

The next problem to solve is, whether, all the species of rats communicate the disease to man? This includes the consideration of the *Nesokia bengalensis*. From the oldest writers descriptions are found of the attack of plague among rats. They do not mention that rats communicate plague. The European idea of the attack has originated in modern time, based on a popular belief. For the reference, *Wagicat-i-Jahangiri* as translated in Elliot's History of India, serves the purpose. The Emperor Jahangir says: "In the tenth year of my reign (i.e., in 1614-15 A.D.) a dreadful plague broke out in many parts of Hindustan. It first appeared in the districts of the Punjab, and gradually came to Lahore. It destroyed the lives of many Mahomedans and Hindus. It spread through Sirhind and the Doab to Delhi and its dependent districts, and reduced them and the villages to a miserable condition. Now it has wholly subsided. I asked the physicians and learned men what was the cause of it, as for two years in succession the country had suffered from famine, and there had been a deficiency of rain. Some said that it was to be attributed to the impurity of the air arising from drought and scarcity; but some ascribed it to other causes. God knows, and we must patiently submit to His will."

The description of the attack of plague in mouse or rat is given by Nawab Muctamad Khan, a courtier of Jahangir, in his *Ikbal-Nama*: He writes: "When it was about to break out a mouse would rush out of its hole as if mad, and, striking itself against the door and walls of the house, would expire. If

immediately after this signal the occupants left the house, and went away to the jungle, their lives were saved; if otherwise, the inhabitants of the whole village would be swept away by the hand of death. If any person touched the dead, or even the clothes of a dead man, he also could not survive the fatal contact. The effect of the epidemic was comparatively more severe upon the Hindus. In Lahore its ravages were so great that in one house ten or even twenty persons would die, and their surviving neighbours, annoyed by the stench, would be compelled to desert their habitations. Houses full of the disease were left locked, and no person dared go near them through fear of his life. It was also very severe in Cashmere, where its effect was so great that (as an instance) a *darwish*. who had performed the last sad offices of washing the corpse of a friend, the very next day shared the same fate. A cow which had fed up on the grass on which the body of the man was washed, also died. The dogs also, which ate the flesh of the cow, fell dead upon the spot. In Hindustan no place was free from this visitation, which continued to devastate the country for a space of eight years."

This observation shows that mouse (rat) is attacked before man. It does not mention that mouse or rat communicates the disease to man. What we observe now is that the attack on man and other animals may take place simultaneously or any one of them may take the precedence. When the writer has claimed his recognition for so much enquiry, it would not be safe to say that he laboured under defective observation.

Drs. George and John Thomson in their Treatise on Plague refers to the Old Testament. They say "The earliest historical record (1141 B. C.) noted of a connection between rats and plague is in 1 sam. V—VI and this connection has been frequently met with in many places. In the Himalayan villages the inhabitants look upon the death of rats as a signal to quit their houses and occupy a fresh village site, well knowing by experience that an epidemic of plague is presaged by this phenomenon." In I samuel v. 6, occurs the following: "But the hand of the Lord was having

upon them of Ashod, and he destroyed them, and smote them with emerods, even Ashod and the coasts thereof." An annotator says thus: "The emerods is the same disease as that mentioned in Deut. xxviii 27; and such a distressing malady must have carried home the conviction to every Philistine that it was from the hand of Him whose indignation had been signally and emphatically expressed in the downfall and destruction of their idol. Hence their resolution to keep the ark of God no longer in their possession.

"To this sixth verse the Septuagint and the Vulgate add: 'And the cities and fields in the midst of that region produced mice, and there was confusion of a great dearth in the city.' In the next chapter there is mention made of mice in connection with the emerods; but on what authority or for what reason, these words were added does not appear."

In I samuel vi. 4 and 5 we find: "Then said they, What *shall be* the trespass offering when we shall return to him? They answered, Five golden emerods, and five golden mice, according to the number of the lords of the Philistines; for one plague *was* on you all and on your lords.

"Wherefore ye shall make images of your emerods, and images of your mice that mar the land; and ye shall give glory unto the God of Israel: peradventure he will lighten his hand from off you, and from off your gods, and from off your land."

The same annotator adds: "The mouse here spoken of is about the size of a large rat, and, as it feeds exclusively upon vegetable produce, its multiplication and increase could not be otherwise than extensively injurious to the fruits of the earth and other produce."

It will be seen that the connection between plague and rat was so much as both occurred in the form of pestilence. There is no trace of the suggestion that plague was attacking man and mice or the latter gave the disease to the former.

(To be continued).

RIGHT OR WRONG?

Our Contemporary the Indian Homœopathic Review in its January number opens with a portrait of Dr. L. Salzer. It is well that he has given the picture of the known homœopathic practitioner, who, we are sorry to say, is suffering from a deranged brain. We really sympathise with the family of Dr. Salzar for his severe illness. Be this as it may, we find that our contemporary calls him L. Salzer, M.D. As far as we are acquainted with the facts of his medical status, we know that he is not an M.D. Will our contemporary be so good as to enlighten us when and from which university did he take his degree of M. D.? On question of principle the enquiry has become necessary. If we find ourselves wrong, it will be our duty to correct the erroneous impression.

In the same number, our contemporary says: "Dr. Salzer and the late Dr. Behary Lall Bhaduri did more perhaps to popularise homœopathy here than all others taken together."

It is impossible to understand the full significance of the above sentence. As far as we know neither Dr. Salzer nor Dr. Bhaduri did give any public lecture on homœopathy, as to popularise the system of treatment. We are as yet unaware of any fact that they introduced a new method of enquiry in the practice of homœopathy. The few lectures that Dr. Salzer gave in the homœopathic school of that time have been published. We are bound to ignore the existence of such schools as they were and are nothing but mockeries and bring a bad name to homœopathy. There, most of the students with their despicable knowledge of the English language are admitted; anatomy is taught from diagrams; physiological lectures find no existence; pathology is ignored. Homœopathy in materia medica and practice is the only thing that exists. Our contemporary can be proud of the existence of such schools. Perhaps, it is well known how much the students of these schools are respected by the public. A boy who fails in all his attempts for education finds the chance of being such a homoeopathic practitioner.

So far for the homœopathic schools. As to the assumption of popularising homœopathy, we find in another place: "Dr. Berigny and Babu Rajendra Dutt eager to get an entrance into public favor begging from door to door almost;" We do not know which of these statements is correct, either the first or the last, with regard to the fact of popularising homœopathy. Being old inhabitants of Calcutta and having good acquaintance with the facts of the introduction of homœopathy in this city, we are surprised that our contemporary draws inferences from imaginary perception. We can claim a better knowledge of facts with regard to homœopathy than most of our colleagues. We knew Drs. Salzer and Bhadury long before than that can be claimed by our contemporary. In fact, it should be known that we possess the information which still remains unknown to many.

Our endeavour is to re-unite the homœopathic profession and not to create a division. We are obliged to point out the inaccuracies or wrong imaginations. The priority of the introduction of homœopathy rests with Babu Rajinder Dutt and Pundit Iswar Chandra Vidyasagar. They were attached to Dr. Sircar for his superior education and his bold acceptance of the truths of homœopathy in 1867. Indeed, he paved the way for other medical men to follow. His was the first conversion of a regular practitioner in India. Dr. Bhadury was his junior in the profession and had not these claims. For a full knowledge of facts we refer our readers to the Transactions of the International Congress of Homœopathy.

After all one fact is certain. The obstinate endeavour of our contemporary to ignore the good actions of Dr. Mahendra Lal Sircar, we are sure, will not be successful. History has recorded many events in indelible character the works of those who have strived for the cause of homœopathy. We have not the same feeling for Dr. Bhadury, as he was one of our respected friends, though senior in years. We will gratefully acknowledge the truth if our contemporary show us the way in which he popularised homœopathy. We

know that he had a dispensary both for paid and unpaid patients, and wrote books in Bengalee on homœopathy. Besides these facts we are ignorant of his other attempts for the spread of homœopathy. If the practice of homœopathy and the writing of books in the Bengalee language be passports to applaud the extension of its province, then we surely admit that we are at a loss to understand the refined sentiment.

We again reiterate that let the dead past bury its dead. They were all noble men who worked for homœopathy. The simple question is, what have we done for homœopathy ? To our shame, we must admit that we have done nothing. The time has come that we should do something for our internal consolidation. Setting aside our petty spites and jealousies, we earnestly wish that we should be united for a common effort to inaugurate a good period of work. We have appealed to our colleagues to have our necessities. Our combined assiduity will be able to achieve many desired objects. The next tenth of April will be the 150th Birthday Anniversary of Hahnemann. Let that be the rainbow of peace with us for our consolidation. We will feel happy if Dr. Pratap Chandra Mazumdar be able to reunite the scattered flock.

COMMON DISEASES AND THEIR TREATMENT.

IX.

(Continued from last Number, p. 15.)

Mimosa is লজ্জাবতী of Bengal. It has three species, Mimosa pudica, M. rubicaulis or M. mutabilis, and M. humilis. The leaves are taken for tincture. Dr. Mure has introduced the medicine from South America. He mentions the first and third varieties. It has inflammatory swellings of scrotum, hand and ankle, with redness, tension and lancination. Prostration accompanies these symptoms. Clarke writes: "The most notable symptoms were lancinations in the back and limbs, and 'swelling and redness of left ankle with tension and lancination.' The last symptom has been confirmed." It remains to be observed whether other inflammations, especially that of scrotum may have its beneficial effect.

Moschus has bruised pain over whole body: swelling of hands with shooting pains; pain like burning in toes or as if squeezed by short boots; burning pressure on tips of right toes; jerking pains in nails of two first toes as if they would suppurate, could not bear anything to touch them, could only walk barefooted on the heel; pain in nape of neck as if muscles were torn from their attachments; violent drawing in nape, unable to turn head; drawing pain from second cervical vertebra to shoulder; drawing pains in spine which extend into hip-joint, and there become so violent that he cries out; partly jerking, partly drawing pains in spine; acute pressure in sacrum and coccyx, as if caused by a dull instrument. These symptoms indicate that the muscles covering the whole vertebral column are affected. Constrictive tension and drawing jerking pains are its characteristics. Not only the back along the spine suffers from these pains, but also the muscles of the chest feel the constriction. Its other sphere is the pain in the last phalanges of fingers and toes, including the nails. Clarke remarks: "*Mosch is suited to* spoiled, sensitive natures and hysterical women and men." Musk has not been used in other inflammations besides

pneumonia, and laryngismus stridulus. We are in the dark whether it may prove successful in inflammations and congestion of muscles.

Murex produces contusive pains. They are confined to chest, hip and lumbar region, forearm, and thigh. The medicine mostly affects the female sexual organs, and we have sore pain in uterus.

Muriatic acid has sprained pain after writing with back bent; aching pain in back, as from having been bent double for a long time, or from a strain; bruised pain in all joints; swelling of extremities of fingers, with burning; swelling of knees; lancinations in tendo-Achilles, day and night, which hinder walking and sleeping; swelling and redness of extremity of toes, with burning.

Doubt is reasonably entertained whether Muriatic acid can be used in a case of primary inflammation. It is applied in cases of inflammation coming as a sequel in low conditions of health after long-standing febrile conditions. In inflammatory complications during or after fever, it can be fitly used. Burning is a characteristic of the medicine. So far it may be said that inflammations occurring in low conditions of health require its use whether in the presence or absence of burning.

Mygale or Mygale Lasidora Cubana is a large black Cuban spider. It has following symptoms:—Intense redness in streaks in course of lymphatics, from calf to body, with great anxiety, twitching of limbs; local inflammation extensive, from foot to knee, having a large violet spot which changed in a few hours to green. Clarke remarks, "The pathogenetic data of Mygale consist of a proving by a young lady and the effect of a bite on a man. In the latter case, inflammation ensued which spread along the lymphatics, violet and afterwards green discoloration." From these facts it appears that Mygale is a medicine for lymphatitis. As the inflammation of lymphatics generally does not confine within the specified limit but spreads into the surrounding tissues, it may be used in inflammatory swellings which owes its origin from lymphatics. Another noticeable fact

is that the virulent poison of the Cuban spider caused the inflammation. The necessary conclusion is that any violent inflammation which is the product of a poison should have its aid. The supposition is that the poisons of the spiders act with less intensity than those of the serpents.

Naja tripudians include two varieties of snakes, *Cobra Gokkura* and *Cobra Kautia*. There are also intermediate varieties between the two kinds. The general characterstic of the Gokhura is white with variegated marks. The Kautia has black colour with concentric rings. There is also difference in the poisons of the two species. The Gokhura ejects yellow thick fluid. The Kautia gives out rather greenish poisons. The poisons are taken from the full grown species of the serpents, which have attained about the length of five or six feet. The best time to take the poisons is in the spring and the beginning of the summer season, that is before the commencement of the rains. During the rainy season they give out diluted poisons. The dilution is due to the imbibition of water. The quality is being deteriorated for that reason.

Another wellknown fact which affects the quality of serpent-poison is recorded by Higgins in his Ophidians. He observes with regard to Lachesis thus: "Just at the time when the snake begins to change to skin and enters into the state of semi-torpidity consequent upon this change, the poison loses its venomous principle, and what is still more singular, the gall loses its bitter principle and becomes sweet to the taste. The poison extracted from the reptile in this state is a milky, thick, viscous fluid, which soon separates itself into a white, ropy sediment, and a supernatant, transparent, slightly viscous fluid, showing no trace of acidity. Neither the sediment nor the colorless liquid alone or in combination causes death in pigeons or dogs, but a septicæmia is produced which is limited and not profound in its action. The poison continues in this condition until the state of torpidity ceases, and when the colours on the new skin are very brightly marked and distinct, the venomous principle is again restored to the poison and the bitter principle to the gall."

It is our practice to use the poison of the Kautia as recommended in the ancient sanskrit medical work the Charaka Samhita. It enjoins the use of the poison of *krishna sarpa* or black serpent. The experiments of Drs. Fayrer and Sircar support the statement of the Charaka that the poison of the Kautia or black serpent is more violent and rapid than that of the Gokhura which has rather a slow action. Dr. Mahendra Lal Sircar was the first practitioner to use the pure poison of the Kautia in homœopathic practice. He always took the poison in his presence directly from the snake procured by the snake charmers. The means generally adopted in this country is to make the serpent to bite on the dry leaf of palm wrapped round an ordinary concave shell which is called झिंवुक *(Jhinuk)*. The serpent in its attempt to bite the dry palm leaf perforates the leaf by the poison fangs and the poison is deposited in the concave shell to be immediately taken in a small bottle. No time is lost to mix the poison with glycerine. If time is wasted in transferring the poison to the bottle or if it is not immediately mixed with glycerine, the poison coagulates, after which any kind of solution is impossible either with glycerine, water or rectified spirit. The fact of the congulation of the poison in contact with air points to a kind of chemical decomposition, which may be due either to the evaporation of some volatile principle or to any kind of unknown change. Be this as it may, the observation is certain that the poison taken out from the fangs of the serpent should be immediately mixed with glycerine. As for trituration, objection is raised on reliable ground that the coagulated product of the poison is an altered material and can not produce the exact morbid effect which is due to the real poison. Formerly, we could not get the desired effect from the poison of Naja tripudians. Now, without mixing the two varieties of the poisons, from Gokhura and Kautia, we do get the effect of Naja by using the fresh secretion from the fangs of the Kautia. It is a noticeable fact that we use the medicine in lower dilution.

In the market the snake charmers sell a yellow powder which

is generally used. It is a combined product of the two varieties of poisons of the Gokhura and the Kautia mixed with mustard oil and dried in the heat of the sun. Its efficacy is doubtful. The Kaviraji *Suchikavaran* is a mixture of many medicinal products. They are Mercury, Sulphur, Lead, Aconite (Ferox or Napellus) and the poison of the Kautia in equal parts and made into paste in a mortar. This paste is soaked in the vapour of a composition of the biles of Rohit fish, hog, peacock and goat, in a well covered earthen ware. The name *Suchikavaran* is derived from the fact that the mixture should be used to the extent as can be taken up at the end of a needle. *Suchika* is needle and *Avaran* is ornament. It is the ornament of the needle. The Kabiraji preparation is not equal to our simple Naja. It is far inferior in its action. Kabirajes use their preparation in the dangerous state of low fevers. We use the poison of cobra in cholera or other diseases which want to support the action of the heart and lungs.

It will not be an uninteresting study to know the classification of poisonous snakes. The following is by Captain G. Lamb, I.M.S., who is making a searching enquiry of snake poisons:—

I. Colubridae.

A. Sub-Family—Elapinae.

Genus Naja. 1. Naja tripudians (Cobra). India.

2. Naja bungarus (King cobra). India.

Genus Bungarus. 3. Bungarus Cæruleus (Common Krait). India.

4. Bungarus fasciatus (Banded Krait). India.

Genus Hoplocephalus. 5. Hoplocephalus curtus (Tigersnake). Australia.

B. Sub-Family Hydrophinae.

Genus Enhydrina. 6. Enhydrina Valakadien (Common sea snake). India.

II. Viperidae.

C. Sub-Family—Viperinae.

Genus Vipera. 7. Vipera Russellii (Daboia). India.

Genus Echis. 8. Echis carinata (Phoorsa). India.

D. Sub-Family—Crotalinae.

Genus Trimere surus. 9. Trimere surus gramineus (Green-pit viper). India.

Genus Crotalus. 10. Crotalus adamanteus (Californian Rattle snake). America.

This classification principally includes the Indian snakes, with which we are interested. According to the experiment of Dr. Mahendra Lal Sircar the poison of Vipera Russelii which is known as Boa wrongly called Daboia (ডুমুরোড়া) proved to be the worst. A full-grown cock died within five minutes from its bite. On the other hand, a full grown cock lives about twelve hours after the deathly cut of a full grown Cobra Kautia. Depending on this fact, it is desirable that provings of the poison of Vipera Russellii should be undertaken by reliable medical practitioners. A short proving has been made, the result of which will be published in due course. Clarke says of Naja thus: "It was introduced into homœopathy by Russel and Stokes, who made the first provings along with some forty other provers, including Gillow, Pope, and Drysdale. It is rather remarkable that with so many able provers *Naja* should not have attained anything approaching the place of importance occupied by *Lach.* Nash suggests this may be due to the fact that many of the provings of *Lach.* were made with the 30th potency, whilst those of *Naja* were with low potencies." The more use of Lachesis than Naja is due to the fact of the introduction of Lachesis long before that of Naja. Lachesis was introduced by Hering in 1835 in the Archives, and in 1837 into our materia medica. Dr. Rutherford Russel, who with Dr. Stokes carried on the provings of Naja, contributed the account of these experiments in the eleventh and twelfth volumes of the British Journal of Homœopathy, that is, in 1853 and 1854. The action of the two serpent-poisons are almost alike. The extended use of Lachesis has thrown Naja in the shade. In India cases of failure of respiration or heart's action is mostly treated

by Naja and not by Lachesis. Success has been gained by Naja in a few cases, as has been shown by Major Deane in his cases of plague. In cholera a few laurels have also been gained. The fact is that an extended proving and clinical use of Naja has become necessary.

With regard to the use of Naja in inflammatory swellings we have a few symptoms. They are: Pain in neck and back; pain between the shoulders as if in spine, afterwards involving scapulæ, worse when moving arms; dragging sensation in spine between shoulders; aching in loins; acute pain in small of back; aching in ankles, lower part of thighs, wrists, and shoulder-joints, bruised on waking; burning pain in wrist, and he hung down his arm, from which a few drops of blood fell (from the bite); swelling of hand and thumb, of hand and arm with spots, of bitten hand and of arm and breast of same side with livid spots; pain in finger and thumb-nail (where virus has entered) running up arm; pain in bitten toe, ascending to top of thigh, then pain in belly, which was tense and swollen; swelling of body; local inflammation; large pimples on inflamed base. It may be said that Naja has a place in those inflammatory swellings where Lachesis is applicable.

Natrum muriaticum has a peculiarity in medicinal action, serving both as food and drug. The power of both is manifest. Without Common Salt our life is impossible to exist. Hempel and Arndt record important facts with regard to its use as food. They say: "The well-known agent is absolutely necessary to the development of some of the most important properties of the blood, its fluidity, its stimulating qualities, and its own preservation. Lord Somerville, in his address to the Agricultural Society of London, alluded to an ancient law in the penal code of Holland, which obliged criminals to eat bread without salt. The effect of this privation was the development of intestinal worms which literally devoured the poor victims.

"We know that salt is indispensable to the preservation of our domestic animals. Wibmer informs us, upon the authority of Mœglin, that domestic animals died in the northern provinces

of Brazil, unless they were fed on certain portions of salt. According to Roulin, female animals, in the republic of Columbia, lost their fecundity and the flock soon perished, unless they found salt in the plants, water or ground."

Further on, "Salt will be found adapted to conditions resulting from a cachectic deterioration of the lymph, or from a scorbutic disorganization of the blood. That this is the principle curative range of salt may be inferred from the effects which the chronic abuse of salt has been known to produce. Not to speak of the ravages which the continued use of salt-meat produced on ship board, where many other circumstances concurred in the development of this frightful destruction of human life, we may content ourselves with recording the simple facts which physicians have observed in their private practice. Frank, for instance in his excellent magazine, quotes the following symptoms as resulting from the excessive use of salt:

"A literary man was in the habit of consuming excessive quantities of salt with his food. When in the full vigor of his manhood, he was only troubled with a peculiar *eruption upon the skin* and a troublesome *burning during urination*; at a later period of his life, his *eyes* became excessively sore, with considerable swelling of the red, disgusting looking lids, and continual secretion of a saltish, corrosive fluid which irritated the adjoining parts.

"This gentleman's housekeeper had been living in a family who were in the habit of salting their food very much. After her first confinement she experienced the most excruciating pains at the nipple whenever she attempted to nurse her infant; this led very shortly to *inflammation, suppuration* and disorganization of the nipples. After her second confinement the same symptoms developed themselves, compelling the patient to refrain from nursing; the same trouble arose from her third confinement.

"In the meanwhile the husband of this woman was attacked with an *herpetic eruption on the cheek*, which only disappeared

after he discontinued the excessive use of salt to which he was addicted.

"This change in the seasoning of his food with salt had another unexpected effect upon his wife. After every subsequent confinement her nipples remained perfectly sound, so that she was able to nurse her infants from beginning to end, without experiencing any trouble.

"Fank reports another effect of the abuse of salt in a man of fifty-seven years. His general health was good, but he was attacked with an *inflammation* in the middle of the left tibia which terminated in profuse suppuration and ulceration, involving even a considerable portion of the calf. Gradually the ulcer began to secrete a corrosive ichor. After many ineffectual attempts to heal the sore, this was finally accomplished without any difficulty by simply reducing the amount of salt consumed with the food to a moderate quantity; a watery infusion of chamomile was at the same time applied to the sore externally.

"Fank states it as a fact, that infants who were nursed by women who are in the habit of consuming excessive quantities of salt with their food, were attacked with *soreness* of their private parts, of the axillae, and of various glands. The soreness was speedily removed by abstaining from the abuse of salt."

Again, "Christison speaks of a man who killed himself by swallowing a pound of salt; he died with all the symptoms of violent gastro-enteritis. For some of the conditions which are incidental or preliminary to gastro-enteritis salt may be used as a remedy."

The above facts show the provings of the Common Salt, and the explanation of the curative powers of dilutions.

(To be continued.)

EDITOR'S NOTES.

Tribute to Dr. Mahendra Lal Sircar.

The Vice-Chancellor of the Calcutta University on the occasion of the last Convocation said :—

Dr. Mahendra Lal Sircar, C.I.E., M.D., D.L., was born of poor parents, in 1833, in an obscure village in Bengal. He lost both his parents while yet young. He was educated in the Hare School, Calcutta, where, in 1850, he obtained a Junior Scholarship. This enabled him to pass to the Hindu (afterwards Presidency) College, where he soon distinguished himself. In 1855, he entered the Medical College where he remained for 6 years and obtained medals, prizes, and scholarships, in various subjects. In 1863, he went up for the M. D. Degree Examination and stood first. He then commenced to practise Medicine, and in the early sixties, though quite a young man, he succeeded in securing a distinguished position as a practising Physician. Amidst his numberless professional engagements, and his literary and scientific labours, he did not for a moment forget, what he had long been impressed with, that his country could only be regenerated through the cultivation of Science. His conviction was, to use his own words, that "the only method by which the people of India could be essentially improved, by which the Hindu mind could be developed to its full proportions, was by the cultivation of the Physical Sciences." He urged the establishment of a Scientific Association for the encouragement of scientific research among his countrymen, and, after many years of hard labour and great self-sacrifice, he succeeded, in 1876, in starting the present "Indian Association for the Cultivation of Science" under the patronage of the then Lieutenant-Governor, Sir Richard Temple. The Association has now made considerable progress, and has a well situated local habitation, a good lecture hall, and a well equipped laboratory. Dr. Sircar was appointed Fellow of the Calcutta University in 1870, and was for some years President of the Faculty of Arts. He was appointed Sheriff of Calcutta in 1887 and was a Member of the Bengal Legislative Council from 1887—1893. In 1883, in recognition of his work, he received the decoration of C.I.E., and in 1898 for his services in the cause of education generally the University of Calcutta conferred upon him the degree of Doctor in the Faculty of Law. Dr. Sircar was a man of remarkable personality. The strongest trait in his character was his sturdy independence, joined to his unflinching devotion to truth and duty.

Rai Surya Kumar Sarbadhikari Bahadur, G. M. C. B.

Dr. Surya Kumar Sarbadhikari died on the 6th December last at Madhupur, in his seventy-second year. He was the oldest practitioner of the dominant school, having taken his degree in the pre-university days. They had then the only qualification of G. M. C. B. or Graduate Medical College, Bengal. Only another gentleman of that stock still remains to show the connecting link between the old and the new practitioners of medicine. He is Babu Deno Bandhu Dutt of Ramkristopore, Howrah. In 1851 Dr. Sarbadhikari entered the Medical College and came out of it with many honours in 1856. Practising the healing art, he was kind to all who asked his help in their distress.

Dr. Sarbadhikari entered the service of the government, on board the "Fire Queen," a troop ship. In 1857 he was appointed medical officer in Ghazipur. During the dark days of the mutiny, his services were required for the British army especially in their operation against Babu Kumar Sing of Jagadishpur. The rebel leader is made famous by General Kaye in his History of the Sepoy Revolt. Dr. Sarbadhikari had an arduous task to perform. He associated with Sir Joseph Fayrer when he was with General Havelock on his march to Lucknow. After these energetic services he resigned his appointment and settled for private practice in Calcutta.

With homœopathy he had a touch. He was above the general antipathy of the old school towards the new. He was not reluctant to try a few homœopathic remedies in selected quarters.

With the noted family tradition, he leaves behind him a large progeny of eight sons, two daughters, twenty-eight grandsons and seven great grandsons.

It may be said that the Sarbadhikaris are a prolific Hindu family.

Infant Mortality.

The Infants' Health Society has published a pamphlet entitled "The Present Conditions of Infant Life, and their Effect on the Nation," which directs attention to the almost complete failure of our present method of rearing the infants of the working class. In the poorer parts of the larger towns and cities it is not uncommon for nearly *half* the children born to die in infancy. The dominating cause of this appalling mortality is the improper feeding of the infant. *Nature*, December 8, 1904.

Microbe of Small Pox.

Dr. W. E. de Korte, at a meeting of the Pathological Society of London on November 15, described what he believes to be the parasites of small-pox and vaccinia. In the lymph of the eruptive spots in both these diseases he has detected bodies measuring about 1/2500 inch in diameter, amœboid, and containing refractile granules; these he regards as amœboid protozoa. They are extremely delicate, breaking up and disappearing on all but the gentlest manipulation, and on attempts to stain or preserve. They seem to be very similar to the bodies described by Funck some years ago under the name of *Sporidium vaccinale.*—*Nature,* December 1, 1904.

Dakhyl v. Labouchere.

This was an action for damages for libel by the plaintiff, a medical man with foreign qualifications, against the editor of *Truth.* The plaintiff had acted as medical adviser to the Drouet Institute for the Treatment of Deafness. *Truth* described him as "a quack of the rankest species who had left the Drouet gang in order to carry on a 'practice' of the same class on his own account." At the trial before the Lord Chief Justice £100 damages were awarded. On appeal a new trial has been ordered on the grounds of mis-direction in that Lord Alverstone directed the jury to find the words libellous whereas he should have left it to them to say whether they were libellous or not. An important pronouncement by the Master of the Rolls was that a man may be fully qualified to practise medicine and yet may be fitly termed a quack if he claims power to remedy conditions which are irremediable.—*Lancet,* December 31, 1904.

Water Purification.

The December number of the *Century Magazine* contains a most interesting account, by Mr. G. H. Grosvenor, of the new method of purifying water—both in small quantities and when stored in large reservoirs—by means of blue vitriol (copper-sulphate). It has long been known that copper is fatal to bacteria, but the fear has hitherto been that the amount required to effect the destruction of such organisms would likewise be injurious to man. Dr. G. T. Moore has, however, announced in an American official publication that he can

employ copper in such a diluted form as to be quite harmless to the higher forms of animal, and yet sufficiently potent to destroy the germs of cholera and typhoid, as well as mosquito larvae, in a few hours. The method of introducing the copper-salt into the water is fully explained in the article. It may be added that the treatment is stated to be equally efficacious and safe for sterilising milk. As an illustration of the effects of copper in destroying bacteria, it is mentioned that such organisms are never found on copper coins, although abundant on those of silver, and it is mentioned that artisans in copper-works are immune to bacterial diseases. Whether we have been wise in abolishing the old-fashioned copper tea-kettle is one of the questions raised by the new operations.—*Nature*, Dec. 15, 1904.

Toilet of the Anus.

Mr. A. G. Miller read a communication entitled "The Toilet of the Anus." He drew attention first to the risk of carrying infection to the various parts of the body by the hands and clothes from an insufficiently cleansed anus. He then described a simple method of cleansing the anus. He pointed out that any method of cleansing caused contamination of the hands and that, therefore, careful and thorough cleansing of the hands and especially of the nails was necessary also. Mr. Miller drew attention to one or two affections probably due to want of proper cleanliness, as pruritus ani, abscess, fissure, and piles. In regard to the last he advocated the use of injections of a few ounces of cold water as well as washing after defecations as an excellent prophylactic.—Dr. W. Allan Jamieson said that he was in the habit of advising patients to carry with them a box containing a sponge for the purpose of washing the anus. He had found that patients obtained marked benefit in pruritusani from the injection into the rectum each night of a wineglassful of warm thin starch to which had been added two drachms of liquor bismuthi. This was retained during the night and was markedly soothing in effect.—Dr. J. O. Affleck referred to the fact that nurses were not in the habit of cleansing the anus of patients thoroughly and said that this was especially important in cases of typhoid fever or cholera.—Dr. W. Taylor described a douching apparatus which could be easily fixed to the water-closet.—Dr. H. M. Church referred to the necessity of thoroughly cleansing the nozzle of the enema syringe.—*Lancet*, December 17, 1904.

The Parasites of Small-pox, Vaccinia, and Varicella.

The parasite of vaccinia and variola is described as an amœboid organism about $\frac{1}{2500}$th of an inch in diameter its protoplasm containing highly refractive greenish particles regarded by Dr. de Korte as spores, which in many cases render the nucleus invisible. On the warm stage in the case of the amœbæ found in human vaccine lymph there is very active amœboid movement, while in the case of that from small-pox lymph although alteration of contour occurs no pseudopodia have been seen. In glycerinated calf lymph large amœbæ are to be observed which are regarded by Dr. de Korté as encysted forms. The amœbæ can best be studied in hanging-drop preparations of the lymph itself, and since they are very easily destroyed by the manipulative processes required for staining they may not be found in stained preparations, although they are capable of being stained. Dr. de Korté discusses the possibility that the supposed organisms may be leucocytes and negatives it among other reasons because they persist in the lymph for as long as six months, whereas leucocytes in human blister-fluid disappear after 14 days even though kept at the body temperature, which would hardly seem a very cogent reason in the absence of details of the origin of the blister fluid or of information of the duration of life of leucocytes in vaccine or variola lymph. Dr. de Korte states that no multiplication of the amœbæ by direct division and no sexual reproduction have as yet been observed, and then writes that he hopes shortly to publish a paper on a method of cultivating the organism *in vitro*, statements which are something difficult to reconcile. A protozoon or sporozoon has by several observers been described as occurring in the lymph of vaccinia and variola and has been regarded as the *contageum vivum* of these diseases, although the proofs seem in all cases to be incomplete. Quite recently the same claim has been made in reference to scarlet fever. The observations are therefore of interest but it would seem to be wiser to suspend judgment until the further details of the life-history of the organisms promised by Dr. de Korte are published.—*Lancet*, Dec. 24, 1904.

Spontaneous Rupture of the Heart in an Insane Patient.

By H. Kerr, M.D. Glasg.,
Assistant Medical Officer to the Bucks County Asylum.

This is a rare occurrence considering the frequency of degeneration of the heart muscle in the insane. According to the returns of the

causes of death in the reports of the Commissioners in Lunacy for the years 1902 and 1903 it occurred nine times in 18,601 deaths and of these four cases were those of males and five were those of females, showing that sex has little to do with its incidence.

In the present case the patient was a man, aged 76 years, who died in the Bucks County Asylum after 14 months' residence. Mentally he was somewhat depressed and suicidal on admission, his condition passing into one of mild dementia. Physically he was rather feeble but stout and flabby. The pulse was regular but weak, the heart sounds were feeble and distant in character, and cardiac dulness was considerably increased. There was nothing of importance in the subsequent history of the case and the patient appeared as usual on the night of his death. He was found dead on the floor of his room, having apparently got out of bed and collapsed.

At the post-mortem examination the pericardium was found to be much distended with blood-clot and fluid. In the heart a small tear was found in the left ventricle, anteriorly, at the lower end near the apex in the long axis of the organ and plugged with blood clot. Internally the tear was found to be somewhat smaller than externally. The heart was much hypertrophied (weight 18¾ ounces), more especially the left ventricle, the muscle was soft, fatty, and very friable, while the valves and coronary arteries were atheromatous. The immediate cause of the rupture could not be determined, the factor of extra strain or stress being practically eliminated.—*Lancet*, December 31, 1904.

Personal Identification.

During the present year two cases bearing on the question of personal identification have aroused considerable interest. That relating to Mr. Adolph Beck, who was twice convicted at the Central Criminal Court and once served a long term of penal servitude, stands forth as a striking instance of miscarriage of justice. There was false identification in almost every particular. Reviewing all the evidence as regards the physiognomy of Mr. Beck and the man Smith, for whom he was mistaken, it is difficult to understand how they could have been considered one and the same man except for the fact that Mr. Beck was not well known to the persons professing to identify him, for Mr. Beck was of fresh complexion and had brown eyes. The

marks on the body of each were in the main distinctive and one in particular was absolutely characteristic. Nothing short of gross negligence and blundering obtained at every stage of observation. The case of Donovan and Wade, who were recently convicted, sentenced, and executed for the murder of an old lady in the East of London, differed materially from the foregoing in that the identification was by individuals who had known them by sight for considerable periods. That both criminals were in, and near, the house of their victim at or about the time of the tragedy was amply proved. Nevertheless, it is doubtful if a conviction would have been obtained had there been reasonably trustworthy testimony to support the plea of an alibi. The amended criminal law allows a person indicted for murder to give evidence on oath on his own behalf. Neither Donovan nor Wade dared to face the ordeal of cross-examination. The refusal of a prisoner to go into the witness-box must not be directly commented on to his disadvantage; at the same time the fact is bound materially to influence the minds of the jurymen who have to pronounce him innocent or guilty. In a recent leading article we took occasion to suggest methods by means of which the risks of mistaken identity would, in our opinion, be considerably reduced.—*Lancet*, Dec. 31, 1904.

Remarkable Trials for Murder.

A trial for murder, recalling in many of its features the Dougal case, was recently held in Ireland. A man named Fee was charged with having killed another and burying his body in a manure heap where it lay undiscovered for many months. In spite of advanced decomposition the tissues in some measure had been preserved by lime so that it was possible to observe a vertical out in the throat similar to that inflicted by pig killers. Fee's occupation had given him considerable practice in this method of despatching animals. The case is remarkable in that on two occasions the jury disagreed, while so convinced were the prosecuting authorities of the guilt of the accused that they refused to enter a *nolle prosequi*. At the third trial a conviction was obtained. The death penalty was carried into execution.

An extraordinary case was tried at the Durham assizes before Mr. Justice Grantham on July 16th. A pitman named Breeze, aged 21 years, had lodged with another pitman and his wife named Chisholm. He appears to have become enamoured of the woman who told him

that her husband was jealous and added, "I wish I was dead." The prisoner replied, "Shall I kill you?" and immediately strangled her. He gave himself into custody. At the trial he protested his guilt and said that he would like to put the rope round his own neck. Previously to the tragedy Breeze had borne a good character. He was an energetic football player, a non-smoker, and a teetotaler, antecedents strangely at variance with those commonly associated with the commission of deadly crime. Medical evidence was called to prove that he was fit to plead and having pleaded guilty he was as a matter of course condemned. The case was evidently on the borderland of impulsive insanity and gross moral depravity. It was one in which medical testimony as to the state of the prisoner's mind at the time he murdered his victim, could not be invoked but it seriously raises the question whether the law relating to criminal responsibility should not be more comprehensive and the pleadings in defence allowed to be more elastic.—*Lancet*, December 31, 1904.

Cases of Poisoning.

From the numerous instances of poisoning recorded of late a few may be selected for special notice. In the *Journal of the American Medical Association* Dr. W. J. Stone gives an account of an interesting case of poisoning by nitrobenzol. A man, aged 22 years, was taken seriously ill at 12.30 A. M. At 3.30 he was in a state of stupor and collapse; his eyes were glazed and his lips, ears, and fingertips were cyanotic. The corneal reflex was absent. At 4.45 slight convulsions occurred and soon after death ensued. At the necropsy the feet were found to be coloured black. The urine contained albumin and the kidneys were in a state of acute desquamative nephritis. There were cloudy swelling and fatty degeneration of the liver cells. It was stated that on the evening preceding his death the man had put some liquid blacking on his shoes. The shoes, and also the blacking, smelt not unlike oil of bitter almonds and each contained nitrobenzol, the fatal dose of which is about one gramme.

An inquest was held at East Grinstead on the body of an aged man who had succumbed to the poisonous effects of helleborus niger, which was intended for application to the skin but which was swallowed in mistake for a liquorice powder. 20 minutes after the poison was taken he felt great pain in the stomach and soon became collapsed from paralysis of the heart centre. Consciousness remained to the

end which came in two hours. Hellebore acts upon the heart like digitalis and also on the nervous system. A case of poisoning by the plant is recorded in The Lancet of July 26th, 1856. p. 100

In the *Scottish Medical and Surgical Journal* for December, 1903, Dr. J. Stuart Rose reported two cases of poisoning by picric acid. In the first case, that of a boy aged nine years, picric acid in the proportion of 30 grains to one ounce of vaseline was applied to scalded surfaces on the cheek and flank. Three days later he was drowsy. There was slight icteric tint of the eyes and the face and the palms were a little yellow. The pulse was 120. On the next day he was still drowsy and vomiting occurred. The temperature was 101·2 F. On the fifth day there was moderate diarrhœa. The whole skin was yellow but mostly on the face, the palms, and the soles. The hair was a deep yellow at the border of the scalp. The urine contained albumin. It was of a dark port wine colour but contained no blood or bile pigment. There was a bright red blotchy general eruption. The symptoms reappeared on reapplication of the picric acid. In the second case a man aged 45 years applied picric acid to a scalded skin. In four days the skin and the conjunctivæ were yellow. In six days the urine was as described above. There were slight diarrhœa and headache. In each case the preparation was too strong. A 1 per cent. solution can be used without bad results.

We have again been induced to comment strongly on the evil effects of inhaling tobacco smoke and to insist that the results are due to carbon monoxide rather than to the generally assumed cause—nicotine. One ounce of tobacco smoked in the form of cigarettes is equivalent to a fifth of a pint of pure carbon monoxide. If two or three mouthfuls of tobacco smoke be passed through diluted blood the latter becomes bright pink and gives the spectrum of carboxyhæmoglobin.

Several interesting additions have been made to the literature of poisoning by illuminating gas. In the *Boston Medical Journal* Dr. F. Holyoke narrates a case of attempted suicide by inhaling this gas which consisted of two parts of coal gas and one part of water gas. There was sweating. The pupils were dilated. The face was cyanotic. The limbs were relaxed. The pulse was imperceptible and the cardiac beat was 140 per minute. Respiration was slow and gasping. There was a naphtha-like odour of the breath up to the fourth day. The temperature was subnormal till the third day. Consciousness returned on the second day. The muscles of the left leg were paretic for several weeks. In the *Dublin Journal of Medical Science* Professor

E. J. McWeeney gives the history of several cases of poisoning by illuminating gas and points out that fatalities from this cause have been more numerous since 1900 when the proportion of carbon monoxide in gas was raised from 6 to 16 per cent. In one instance carbon monoxide was present in the blood to the extent of 73 per cent. of its volume. 2 per cent. of carbon monoxide in air causes headache, giddiness, and muscular prostration, while 4 per cent. is fatal. Dr. Staehelin in a paper read before the Royal Society gives the results of a series of experiments to determine the poisonous value of benzene in coal gas. In frogs motor phenomena were traced to the action of benzene. A small percentage of benzene produced no acute or chronic poisonous effects when inhaled by rabbits. It was suggested that in man minute quantities absorbed by the lungs are rapidly oxidised and secreted as an aromatic sulphate and that the poisonous action of coal gas on mammals was due solely to carbon monoxide. Mr. A. Wynter Blyth supports Vahlen's contention that warm-blooded animals and frogs die more rapidly in coal gas than would be expected from its proportion of carbon monoxide.

Mr. Leslie Roberts gives in the *British Journal of Dermatology* the effects of the double poisoning by antimony and lead from the use of the linotype machine. A man, aged 29 years, had pains in the limbs, tenderness of the fingers, constipation, excessive sweating, muscular tremors, pink discolouration of the palms and the fingers, and faint papular eruptions on the thenar and the hypothenar eminences. Lead was detected in the urine. There was no arsenic in the linotype metal.

On the subject of Wasp and Bee Stings Dr. Phisalix in a communication to the Academy of Sciences, Paris, states the results of experiments conducted by him. Sparrows were found to be very susceptible; they suffered from paralysis, choreic movements, and respiratory failure. Dr. Phisalix believes that there is a convulsive, a stupefying, and a locally irritative principle in the poison of wasps and bees. A fatal case was reported in the *British Medical Journal*, Nov. 5th, 1898, p, 1429. In a case recorded in The Lancet of Oct. 26th, 1901, p. 1120, there were general urticaria, nausea, vomiting, and some prostration. Idiosyncrasy is a factor in some instances. Brouardel mentions the case of a man stung by a bee. He recovered after an attack of syncope. Two years later he was again stung when he died.—*Lancet*, December 31, 1904.

CLINICAL RECORD.

Foreign.

AUSTRALIAN BLUEBELL (*WAHLENBERGIA GRACILIS*) IN A CASE OF DEAFNESS.

By ERSKINE C. WHITE.

This plant belongs to the natural order Campanulaceæ. The following case illustrates its action :—

A gentleman, æt. 72, for three years troubled with increasing deafness, complained of intense pains in head and back of neck, running down the left side of the neck, worse in sinew. The attacks of pain were periodical. His friends have to shout to make him hear. He is of cheerful, firm, hearty disposition, abundant hair and beard : reads with glasses ; has good appetite ; is a total abstainer. He has had heart strain from a fall on a fence. Is constipated.

For three years I gave, off and on, usual remedies for constitution and deafness.

No results, or merely temporary.

Gave *Wahlenbergia gracilis* 3x (from similarity to English Bluebell).

Pains in head increased (from three doses of three drops a day).

Second week, pains in head insufferable. Omit doses one week.

One dose of No. 100. Hearing completely returns, third week.

Hears as well as twenty years ago.

No return of deafness.

Waha. acts profoundly on stomach and bowels.

I selected the Australian Bluebell from its slight resemblance to the English bell, on the line of the "Bell" in botany having an affinity for the ears, after Dr. Cooper's success with the Bluebell.—*Homeopathic World* October 1, 1904.

CARBO VEGETABILIS IN CHRONIC INDIGESTION.

I recently received a visit from an elderly lady, who stated that she had for years been suffering from chronic indigestion. There was much flatulence present, and heartburn was a very prominent symptom. She also complained that she suffered from severe headaches, and was in a state of general debility. The flatulence distended the stomach, causing great oppression and palpitation. The breath also was very offensive. I advised her to take a three-grain powder

of *Carbo vegetabilis* lx trituration three times daily. Upon seeing her again a few weeks afterwards I learned that she had much improved, aud that the symptoms had greatly ameliorated. She continued the treatment on my recommendation, and at the end of six weeks all the distressing symptoms had entirely disappeared. She, however, kept on taking one of the powders night and morning for a further period of three weeks, and afterwards one occasionally to prevent a recurrence of the trouble. *Carbo vegetabilis* is admirably adapted for treating that form of indigestion so common to the aged, in which flatulence is a prominent symptom. In such cases, palpitation being one of the principal symptoms (consequent on flatulent distension of the stomach), the patient often considers that he or she is suffering from organic heart disease. In all such cases a course of *Carbo vegetabilis*, faithfully persevered with, will cause all these unpleasant symptoms to disappear, and dispel the belief that the patient is suffering form cardiac trouble. It must, however, be borne in mind that in all such cases there is a tendency for the trouble to recur, that a dose or two is not sufficient to effect a cure, and that the medicine must be persevered with to do good. I give this warning not unnecessarily, as I have found in my experience that the remedy is often dispensed with and substituted for another drug just at the time when it is commencing to act beneficially.—*Homœopathic World*, Feb. 1, 1905.

PHOSPHORUS IN A PAIN IN UPPER PORTION OF LEFT LUNG.

The value of *Phosphorus* in speedily removing pain in the lungs is now well known. It has proved itself to be of priceless value in the treatment of both chronic pneumonia, pleuro-pneumonia, and broncho-pneumonia, as well as in chronic bronchitis and other chest troubles. Even in the early stages of pulmonary consumption it is often indicated, allaying the tickling in the throat, relieving the congestion, and quieting the cough. A young man (27), whilst out taking a walk one afternoon, suddenly felt a severe pain in the upper portion of the left lung, just underneath the shoulder-blade. It was sharp, and greatly aggravated by inspiration, and accompanied with a sense of heat. There was no cough or other prominent symptom, only the severe pain, as described above. He was given 2m doses of *Phosphorus* 1x on sugar every three hours, and on waking the following morning, although the pain had not left him altogether, it was less severe. By the following morning it had entirely disappeared. The effect of the medicine was permanent, as the pain did not return, although several years have elapsed in the meantime.—*Homœopathic World*, Feb. 1, 1905.

Gleanings from Contemporary Literature.

A NEW THEORY OF THE ORIGIN OF SPECIES.

By A Dastre.

Nearly half a century has elapsed since the appearance of Darwin's work "On the Origin of Species by Means of Natural Selection." It is unnecessary to recall the commotion which that publication produced and the effects which followed. It was the signal for a profound revolution affecting the natural sciences, secondarily other sciences, and even the mental attitude of individuals. The idea of the evolution of living forms, of their descent, or rather of their transformation, already advanced by Lamarck and Geoffroy Saint-Hilaire, was rescued from the oblivion or the indifference in which it had hitherto remained and was imposed, in a manner, on almost the whole scientific world. At present it is accepted with but slight opposition. It is, to be sure, only an hypothesis; but, as it is the only one that has any rational basis, it becomes, because of that fact, almost a necessity. As M. Yves Delage says:

"If there were a scientific hypothesis other than descent by which the origin of species could be explained, a number of naturalists would abandon, as insufficiently demonstrated, the opinions which they now hold."

This may be true, but there is no other scientific hypothesis, and the naturalists of to-day, willing or not, are transformists—that is to say, they are persuaded that living forms are not unrelated to each other, invariable, isolated, brought into existence by special acts of creation, and without any bond of union between them, but that they are, on the contrary related—that is to say, derived one from the other.

Darwinism did not, however, consist merely in an affirmation of transformism, for this had already been advanced prior to Darwin. Transformism certainly arose from the application to the natural sciences of the idea of "continuity" introduced into science by the mathematicians of the eighteenth century. We may thus explain the course taken by that idea as well as the variations which it assumed. The mathematicians passed it on to Buffon, who was originally a geometrician and who entered the Academy of Sciences as such; he in turn transmitted it to Lamarck, who was one of his intimate friends, and from him it passed to Geoffroy Saint-Hilaire. It was however, the illustrious English naturalist who first explained the mechanism by which, according to him, the transformation of one species into another might be effected, thus producing a continuity of living forms. This mechanism is natural selection.

Now it appears that while Darwin succeeded in establishing the idea of continuity of living forms by means of generation—that is to say, transformism—he was much less successful as regards the means which he proposed. To speak plainly, he failed. There are but few naturalists at the present time who attribute to natural selection any role whatever in the filiation of species. As has been remarked by Herbert Spencer, it is not in this way that truly specific characters can be acquired. Besides, when once acquired, they could certainly not be fixed by heredity. It is some ten years since anyone has held to the fixed heredity of characters acquired by a living being in the course of its existence, or at least during ten years past that idea, formerly admitted without opposition, has been fiercely attacked and denied by naturalists of great standing, such as Weismann, Pfluger, Naegeli, Strasburger, Kolliker. His, Ray-Lankester, Brooks, Meynert, Van Bemmelen, and others.

A Dutch naturalist, Hugo de Vries, who has a wide reputation among the botanists of our time, has just given the finishing stroke to the theory

of natural selection, already much shaken, and has proposed in place of it another hypothesis which he calls "the theory of mutation." The name in itself is not very significative and needs to be explained. We shall do that presently. The doctrine is founded on observation and experiments which by the sagacity, long and patient effort, and careful criticism of their author deserve to be ranked with the admirable observations of Darwin. On the other hand, it has been most favorably received by many naturalists. For these two reasons the scientific public is obliged to take it into consideration, and at least, to become acquainted with it.

I.

Every new being resembles the ones from which it ascended, considering those in the widest sense. We say—and it is only a form of speech—that it owes this resemblance to heredity. Heredity, then, is simply the name by which we express the fact that an offspring resembles its parents. On the other hand, the resemblance is not absolute. For example, two animals of the same litter or two plants of the same sowing are never identical. We apply the term "variation,' individual variation, to such divergences or to the tendency which produces them. It is, then, a fact that in new generations there appear new characters which it is impossible to attribute to a reversion to ancestral features—that is to say, they are truly new and undescribed hitherto. It is only as to the extent and importance of such characters that discussion arises.

We cannot deny that variation exists. Living forms have not the rigidity of stone; they vary incessantly, and these variations have been used by breeders for the creation of races. Modifications of this kind are restricted however, within certain limits. Their amplitude is restrained by three conditions, as follows: Generally they are not permanent and they disappear at the same time as do the circumstances under which they are produced; they are not transmissible by generation to descendants; and finally, the modified beings have not lost the aptitude of crossing with those that have not been modified. This is what is meant by declaring that these individual variations cannot create a new species; for these three defects found in the modified being are exactly those which define a species.

Up to the present time no one has ever seen an animal or vegetable species engender another or transform itself into another. In other terms, no one, except perhaps Hugo de Vries, has perceived a living form arising from another form, yet differing from it by features having the value of those which distinguish species, and showing itself inapt for crossing with the parent, although capable of maintaining and preserving itself by generation. Such a profound transformation cannot be accomplished in a moment or by a single effort.

Darwin supposed that such a transformation could be accomplished by degrees. According to his view the cumulative repetition of certain small variations might effect a more considerable transformation. In order to do this it would suffice that they should always be produced in the same direction during a long course of generations. Breeders effect this by reproducing and maintaining the conditions of the original transformation and breeding together the individuals which present such transformation. This is "artificial selection." It is a judicious and methodical exercise of the two properties of heredity and of variation practised the interest and advantage of man.

The supposition of Darwin is equivalent to admitting that nature, personified, acts like man, heedful of consequences and with a method, by "natural selection" having in view the interest and advantage of species. Certain slight variations appearing under diverse influences, for example, under a change in the environment, will constitute an

advantage for individuals. Such individuals are thus better adapted to these new circumstances and have a better chance of survival; these are the ones which will pair and by heredity preserve the advantageous variation, fix it, accumulate it, until there is formed a race, a variety, and finally a new species. This automatic play of the best adaptation favoring certain individuals, permitting them to survive and to reproduce themselves, has here, in natural selection, the same providential role as the breeder plays in artificial selection. It is the best adaptation which designs and chooses the useful variation; it is that which favors the individuals that possess it; it is that, in fine, which degrades the others in the concurrence, either direct or indirect, which exists between animales and plants, in that sort of struggle for existence whose importance was perceived already by A. de Candolle and Lyell, and which results in the disappearance of the vanquished species and the effective triumph of the new one.

It may be noted that natural selection is not a single hypothesis; it is a linking together of three hypotheses. If we separate the links of this chain we can show that not one of them will stand test. The first hypothesis is that of the advantage in the struggle for existence which is given to an animal by the possession of a small, adaptive variation; the second is that of a preservation, by transmission, of this acquired character; the third is the progress, always in the same direction, of these profitable variations, which, accumulating, finally create a specific character. None of these hypotheses will support a searching examination.

In the first place, as to the benefit of a small, adaptive variation, it may be observed that it would be, in itself, too insignificant to give rise to selection. Let us take for example the transformation of an ungulate quadruped into a giraffe according to the Darwinian theory. In this system an increase of some centimeters in the length of the neck would be a favourable adaptive variation; it would allow the animal, in case of famine, to browse upon the verdure of trees some inches higher than his companions could. But with Mivart, Naegeli, Delage, Osborn, Emery, Cuenot and others, we may affirm that in case of actual famine this advantage would amount to nothing and would not assure the survival of its possessor. The individuals who would die would be the youngest or the oldest, or, in a general way, the feeblest. The variation must be considerable in amount in order to constitute a real advantage and in order that the process of selection may be applied to it.

The second hypothesis is, then to imagine that this variation, admitted, for the moment, as useful, may be preserved and transmitted by generation. We have stated above what naturalists think at the present time concerning the transmission of acquired characters. The least that one can say is that it is very much controverted.

The third hypothesis, grafted upon the first two, is the repetition of the variation. Even if we disregard the objections made to previous hypotheses there are still others which present themselves here. It is, indeed, necessary that the variation should continue to be produced in the same direction during a great number of generations in order that it may be recognizable, since it is minute each time it occurs; many additional elongations would be needed in order to produce the neck of a giraffe from that of an ungulate. Lamarck, by placing the cause of variation in external conditions, makes this continual addition of effect plausible. The permanence, or better, the repetition of the processes of variation, will perpetuate itself as long as these external conditions are kept up. For example, in attributing the elongation of the neck of a giraffe to the habit of browsing upon the high leaves of trees and the

effort of the animal to reach those which are still higher, Lamarck accounts for the definite and sustained course of variation. But it is exactly this resource that Darwin took away, since he did not accept the ideas of his illustrious predecessor as to the causes of variation. Decidedly, selection appears to be a process more adapted for preserving a state of things than for creating a new one. It is more conservative than revolutionary.

Besides, this is not the only objection, not even the most serious one, which affects this third hypothesis of Darwin. The principal difficulty with it is that it attempts to account for the considerable change which creates a new species by too slow an accumulation of inappreciable changes. When the Darwinists are pressed closely they demand time—much time; too much time. They require indefinite series of generations in order that the smallest species may be formed. Their adversaries have reproached them with having made our globe too old; this is also the opinion of Lord Kelvin.

In reality it must be that there is not so much delay in the creation of a new species. This is exactly what Hugo de Vries contends. He denies the gradual transformation of species by the addition of inappreciable variations; or, at least, he affirms that they may be produced by a process that is rapid, precipitate, sudden. The now species whose development he has observed have arisen abruptly, as one may say, explosively. This is what the Dutch naturalist calls "spasmodic progress."

II.

The main idea of the doctrine of Hugo de Vries is the abrupt mutation of living forms. The eminent naturalist does not advance it as an *a priori* proposition; he deduces it from his experiments, and he is not afraid of sharply opposing it to the universal view which accepts slowly-acting causes. In the course of the nineteenth century, geology was tossed from the cataclysms of Cuvier and his geological revolutions to the slow causes of gradual evolution pointed out by Sir Charles Lyell; and at the present time it is swinging back with Suess toward sudden transformations. It is interesting to note that a similar movement is occurring in biology; the attempt of De Vries is one of its manifestations.

A great number of zoologists, botanists and paleontologists are inclined to adopt this notion of sudden changes as consonant with the teachings of experience. We may cite in this connection the well-known argument of Agassiz. This celebrated naturalist called attention to the simultaneous appearence, in the first fossiliferous strata, of a mixed fauna comprising representations of all the grand divisions of the animal kingdom. This is shown in the Upper Silurian or Devonian horizon in which the vertebrates make their appearance in the form of fish. In the most ancient fauna, and that which has become known most recently (that of the Lower Silurian or Cambrian), all the grand divisions are still found, except that of vertebrates, each represented by quite high types. It is a question to be decided whether, lower down, in the sedimentary rocks hitherto considered as azoic, there is really a living population, more widely scattered, and reduced to the most rudimentary animals and plants—that is to say, to protophytes and protozoans, as appears from the researches of MM. Barrois, Bertraud, and Cayeux. Yet it is none the less certain that the very important remark of Agassiz is true, and that, in the Cambrain horizon, all the principal types appear simultaneously. We perceive here a sort of explosion of universal life.

In consequence of this the transformists are obliged to admit that in the short space of time that corresponds to the deposit of the most ancient fossiliferous rocks the first living beings must have undergone all the

evolutions necessary for passing from the state of a simple mass of protoplasm to that of types characteristic of all the grand divisions, the vertebrates only excepted. We are authorized to conclude that the time during which the most ancient fossiliferous rocks were deposited was short, because we can judge of it from their thickness, which is much inferior to that of the subsequent strata. Therefore, but a comparatively short space of time was required for the modifications by virtue of which the first living forms produced the principal grand divisons. The Lower Silurian epoch was one of rapid transformations, of active morphogenesis, of intensive mutations. If we wished to suppose that these were caused by the Darwinian mechanism of slow accumulation, of minute variations, we would be obliged to throw back the origin of life into an epoch inconceivably beyond the most ancient geologic epoch now known.

In the same way, as other paleontologists have observed, among whom is Dr. Charles A. White, the extraordinary flora of the carboniferous epoch developed abruptly. We know nothing or but very little of the floras that preceded it. Its appearance and its extinction were sudden.

We might multiply these remarks relative to the abrupt explosions of creation in living things. Here is another. The dinosaurian lizards that abounded throughout the secondary epoch, forming, indeed, the dominant animal type, show an extreme variety taken from any point of view. There were some gigantic ones, like Brontosaurus, having a mass that was certainly equal to that of four or five elephants, others of small stature not larger than a domestic fowl. The group included carnivora and herbivora, aquatic species and terrestrial species, quadrupeds, and bipeds quite similar to birds, except as to the faculty of flight. By the variety of their types of organization they form, as aptly stated by Frederick A. Lucas, a sort of epitome of the class of reptiles. Now, their appearance and differentiation were comparatively abrupt and sudden phenomena. It does not seem probable that they were formed by the mechanism of natural selection and that they were destroyed because of their inferiority to other species in the struggle for existence.

We arrive at similar conclusions from an examination of the first placental mammals. They appeared abruptly at the beginning of the Tertiary period; they assumed a variety of forms almost as numerous as those of the mammals of to-day, and they finally disappeared.

Besides the paleontologists, many naturalists have pointed out the existence, in animals of our own time, of abrupt variations that produce a new type that becomes fixed as soon as it appears, and that has the value of a species distinct from that from which it was derived. Mivart and Huxley, Clos, Camerano, and Bateson have called attention to the existence of such discontinuous variations, which may afford an explanation of the discontinuity of species. Yet the greater number of the examples adduced by these authors may be referred to the category of monstrosities or teratogenic variations which have succeeded in becoming fixed. This is the case with species of Asserias having numerous arms, with crinoids having three or four divisions, with a certain number of levogyrate gastropods. However, abrupt transformations have been noted by entomologists under perfectly normal conditions. Standfuss, to whom we are indebted for some extremely interesting experiments on the heredity in butterflies, speaks of "explosive transformations," thus expressing the richness in new forms suddenly produced from a single parent stock.

III.

The origin of the new theory of Hugo de Vries must be sought for in this mass of observations, facts, and theoretical ideas relative to the abrupt variation of species in opposition to the Darwinian idea of slow variation.

The Dutch naturalist has, in a manner, worked over all these ideas and codified them into a coherent system. This system already existed in embryo in the well-known little work which he published in 1889 on intracellular pangenesis. His views were, at the time, purely theoretical, for he had then only just begun his experimental verifications. Since then, however, some of his experiments have succeeded in an astonishing manner. To-day, therefore, it is the views that have been scrutinized and verified which the celebrated botanist presents to the scientific public in his work on the Theory of Mutation, recently published at Leipzig.

His doctrine consists, as might be anticipated from what we have said, in the denial of gradual transformation and the affirmation of abrupt transformation. Species in general do not enjoy that perfectly uniform and monotonous existence which has been assigned to them by naturalists of the school of Linnæus and Cuvier. Paleontology teaches us that they have a commencement and an end and that, during their term, they present periods of two kinds, periods of mutation and periods of equilibrium, times of calm and times of revolution. The observation of existing species confirms this view.

Ordinarily the principal "period of mutation" is found at the earliest stage of the species, at the time of its birth, but this is not absolute. However, the phase, or the entire group of phases, of plasticity, is more or less brief in comparison with the rest of its existence. It is only at these epochs that the living being is susceptible of mutations of a specific character; it is unchangeable for the rest of the time, that is to say, during the greater part of its term. Because of this the period of plasticity or of mutation usually escapes attention and we observe the greater number of species exactly at the moment when they have become really invariable—that is to say, susceptible only of those small, secondary, modifications which may, at most conduce to the formation of varieties and races.

When on the contrary, the species is in the period of mutation it offers an abundance of specific variations, distinct in character from the small individual ones. They are, in fact abrupt, clearly marked, permanent, fixed, and hereditary as soon as they appear, and the new forms are infertile when crossed on the parent stock. In a word they accomplish a transgression of the limits of a species.

Such is the new hypothesis of mutation. Before detailing the experiments on which it is founded, and furnishing the justification of its accuracy, it would be well to establish its signification, its scope, and its consequences.

This theory is a sort of rehabilitation of the idea of species. It does not, however, consider species as the fixed entity, the special and immutable category of the Creator's thought, conceived by the naturalist who followed Linnæus. It is truly a transformist doctrine; it admits the possible existence of an infinite number of species derived one from the other. Nevertheless it must not be denied that it confers on species an objective existence, a sort of reality that is foreign to the conception of the transformist school. "Species appear," says Hugo de Vries, "like invariable unities, such as are necessary in a systematic classification. Their existence is real, like that of individuals. A species is born, has a short period of youth during which it is subject to specific mutation, is maintained in an adult condition during a period which may be of great length, then finally disappears."

The doctrine of Hugo de Vries is opposed to that of Darwin in almost every point. The Darwinian theory has for its corner stone individual variation; the new theory, specific mutation.

Individual variations are progressive, usually guided by adaptation

to the environment in a direction determined by the "survival of the fittest." They are continuous—that is to say, they are produced at all periods. Mutations are quite different. They are metamorphoses, not determined by adaptation; they are produced in various ways, without any direction; they are sometimes injurious, sometimes profitable, sometimes indifferent to the individual—they appear only at certain periods of the life of the species. Besides, both of these transformations occur from the action of causes which are determinate but whose nature is unknown. The first affect, more or less profoundly, all parts of the organism; the others affect in a special way the function of reproduction. In the Darwinian theory the first form is separated from that which differs from it specifically by a long succession of generations. According to Hugo de Vries the first form which engenders another, and, ordinarily, many others, coexists side by side with this daughter species. It is only after its formation that the latter enters into competition with the species from which it sprang, and circumstances decide which shall survive and which shall disappear. Here the struggle for existence and selection suppresses species but it does not create them. In brief, the most characteristic feature of mutation is that it is a manifestation of a physiological character, connected by special conditions with the function of reproduction.

In one point only the two doctrines agree, viz., that very marked differences in organization are the effect of the disappearance of intermediate links. In the case of mutation the new form, although quite markedly distinct from the parent one, does not necessarily show great divergence from it. Its difference may sometimes be anatomically very slight, although they are physiologically very marked, since they inhibit any crossing. Great morphological divergences always result, as in the theory of Darwin, from a series of repeated mutations. These changes are, however, crowded together in a time relatively short, since newly formed species are, at the very moment of their formation, in their phase of plasticity, in their crisis of mutation.

IV.

We have now to state the evidence in favor of this doctrine and the foundations on which it rests. We may count in its favor the advantage of its reconciling the transformist hypothesis, which is necessarily logical with the immutability of species, which is according to De Vries, a proved fact. It succeeds in doing this as has been seen, by supposing that there is in the life of the species a period of crisis, so to speak—a temporary period of mutation which interrupts for a quite brief period the habitual invariability. In this it harmonizes with Darwin to a certain extent.

Hugo de Vries considers that the existence and invariability of species are facts supported by daily observation. He refers to the memorable experiments of Jordan and his followers, who made thousands upon thousands of sowings of vegetable species and never observed the passage of one into another—that is to say, a true vegetal mutation; they only obtained differences now classed under the head of individual variations. These, as is well known are of such a nature that if we avoid artificial isolation, segregation, and selection, the forms revert to the primitive type. It is vain for transformism to deny this remarkable fixity and to replace it by an hypothesis of changes so slow, so minute, and so gradual that they become evident only after the lapse of centuries, and inevitably escape our observation at the moment.

Another fact that accords with the theory of mutation is the existence, in certain genera, of animals and plants of a great number of species that differ from each other but little anatomically. Botanists are aware that most Linnæan species are groups of living forms that are constant,

hereditary, and usually infertile when crossed; that is to say, they are specifically distinct. Yet they differ so little in their aspect that many naturalists mistake them or confound them with each other. It would appear as if, at a given moment, in a crisis of mutation, the parent stock had become resolved into a multitude of secondary species which have persisted. For instance, the group of roses contains more than a hundred wild species so similar to each other that the most experienced connoisseurs make mistakes in their determinations. The thorn bushes, the willows, and the Alpine gentians are other examples of the same peculiarity, as are also the pansies and the sunflowers. In the animal kingdom many genera of insects present the same phenomena.

These, however, are merely agreements. H. de Vries has not contented himself with noting them; he has sought direct proofs of his hypothesis. The best one would be to find a plant that was actually in its period of of mutation and that might beget, by means of seeds, a number of daughter plants in which there should abruptly appear the characters of a new species. We may readily apprehend the principles which would guide him in his researches. It would be necessary to experiment with genera of wild plants that have a large number of closely related species. Jordan has indeed, established the fact that the greater number of wild species now found in Europe are specifically immutable. Yet it is possible that they may not all be so and that some may, at the present time, be undergoing a crisis of mutation. There would be more chance of finding such among the species that present a great many subspecies, this being a sign of plasticity leading to the presumption of mutation. H. de Vries, therefore, experimented with 100 plants that satisfied this condition—centauries, asters, cynoglossi, carrots, etc. He chose seeds from those which were distinguished by some peculiarity or deviation, like fissuration of the leaves, ramification of the spines, etc. He arranged for the sequestration of the plant as soon as the peculiarity appeared, and before flowering. In order to avoid hybridization he enveloped the floral beds with bags of transparent parchment and fertilized the flower with its own pollen. The greater number of his attempts failed. Only one fully succeeded, thar which related to the onagra of Lamarck, the *Oenothera lamarckiana*.

This plant is well known as the biennial onagra, or ass's herb, brought from Virginia to Europe in 1613. It is a tufted, herbaceous plant about a meter in height, with simple leaves bearing some resemblance to an ass's ear whence the name of the plant. It has handsome flowers, usually yellow in color. Its red tap root (red rampion) is edible. Introduced into Holland, it became acclimated and is cultivated there; it also grows there in a wild or uncultivated state, escaped from gardens and from cultivation.

One species of this genus, the onagra of Lamarck (*Oenothera lamarckiana*), was especially abundant around the little city of Hilversum. Now in 1875 it was noticed that in this district this species showed unusual vigor and a remarkable power of multiplication and dispersion. Varieties were multiplied in profession, and there was, therefore, reason to suppose that the plant was in its plastic crisis, in its period of mutation. H. de Vries cultivated it in his experimental beds at the botanical garden of Amsterdam, not for the purpose of favoring the production of organic forms by means of culture, but because by this means such forms could be preserved, aided, protected, and given more chances of maintaining themselves. These sowings were continued and the plants were observed during a period of fourteen years, from 1886 to 1900. In 1887 a new type made its appearance. In 1888 there were already two new species. In 1900, after eight generations, H. de Vries had obtained. from 50,000

plants produced from his several sowings, 800 new individuals belonging to seven undescribed species, There are, then, 800 individuals in 50,000 that are undergoing specific transformation. The activity of the mutation which this plant exhibits is, therefore, expressed by 1½ per cent.

The new species do not at all resemble the varieties of the parent stock. They appeared suddenly, without preliminary or intermediate forms. The care devoted to these experiments gives them a value which must attract the attention of naturalists. Their result furnishes a new and powerful argument in favor of the theory of mutation.—*Scientific American Supplement*, December 10, 1904.

THE PROBLEM OF HEREDITY FROM THE PSYCHIATRICAL ASPECT.

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The results of Dr. Beard's important investigations have, I am sure, impressed us as a very distinct biological advance. By proving the direct continuity of germ cells from generation to generation and establishing antithetic alteration of generations in the metazoa, Dr. Beard has displaced theory by solid anatomical facts and given us a clearer insight into the problem of heredity.

I have been asked to examine the bearing of Dr. Beard's findings on insane heredity viewed from the clinical aspect, and to consider the question of mental heredity with special reference to the inheritance of acquired qualities.

You are all only too well acquainted with the difficulties experienced in trying to obtain trustworthy evidence of heredity as well as with the fact that but in a small minority of instances we are enabled to reliably trace the chain of hereditary continuity beyond the fourth generation. We are consequently not yet in possession of sufficient facts to warrant the laying down of any definite laws regarding mental heredity. Another obstacle in the path of progressive knowledge is the impossibility in most varieties of alienism to decide the question in what number of cases mental derangement propagated to the offspring has been actually acquired by the parent. It is within our knowledge that certain types of mental disturbance are or may be acquired. This applies above all to audit general paralysis and the various forms of alcoholism, in a small measure to epilepsy, and lastly, to the post-traumatic disorders of the cerebro spinal system.

To gain, therefore, a clear and comprehensive view of the extent to which clinical experience is prepared to support Dr. Beard's teaching, I shall first of all consider these four types of mental unsoundness.

In taking up the investigations of these conditions with regard to the purpose we have in mind, three principal groups of heredity may be distinguished throughout this paper, to wit, homologous, dissimilar, and what I shall term "mixed" heredity—that is, homologous heredity on the side of one parent and dissimilar on the part of the other. Our attention to-day will be mainly focussed on instances of the first group—ancestor and descendant exhibiting the same variety of mental affection.

The main questions we shall have to discuss in the light of my material and with regard to Dr. Beard's findings are.

1. Is there any clinical evidence of acquired mental abnormalities being transmitted to the offspring?

2. To what extent in insanity does environment influence the germ cells, and under what circumstances does it affect the same?

My experience, covering two decades of metropolitan asylum life, is based on the histories of 3,329 cases, which I considered sufficiently

reliable, and which have been selected from 12,000 odd records of Dalldorf Asylum. Taking into account the time-limit at my disposal I shall strictly discard every unnecessary detail, reserving all particulars for a fuller memoir at a future date, and confine the scope of this paper to the most salient facts as suggested by my material.

In adult general paralysis we have a true type of acquired mental derangement. As regards the etiology, I find myself in complete concurrence with those who hold that in most instances the invasion of the organism by the syphilitic virus is a necessary step in the production of the disease. Too much insistence cannot be laid on this point. Environmental influences such as stress furnished by the circumstances of life, particularly inebriety so frequently occurring in those who have been syphilitic, I regard as predisposing factors, and as agents very often accelerating the morbid process. A much greater allowance, however, has to be made for the force of hereditary predisposition, all the more when we realize the preponderance of syphilitic victims who never develop general paralysis or any other nervous complaint.

Among 1,151 male and female paralytics a small proportion were constituted by congenitally weak minds, and sometimes there was a history of early convulsion. In very numerous examples a distinct family history of insanity has been obtained, and, according to recent researches by Drs. Arnott and Junius of Dalldorf Asylum, particular weight attaches to the incidence of bilateral heredity, in which cases they could state on an average a three years' earlier onset of the disease than in instances having a less pronounced hereditary record.

Frequently there is a negative report of direct inheritance, while the pressure of collacteral heredity or the occurrence of identical or allied affections in brothers, sisters, or relatives may afford indication of some degree of mental abnormality in the remoter ancestry.

In very few examples I have contrived to trace back heredity beyond the fourth generation. The offspring of paralytic parents are frequently imbeciles, idiots, victims of infantile cerebral paralysis, sufferers from early epilepsy, chorea, meningitis, congenital syphilis, and various other neurotic ailments. There would be a considerably larger number of these youthful invalids but for the high rate of sterility, miscarriages, stillborn and short-lived offspring. I have recorded 150 absolutely sterile marriages, not including those productive of a more or less long train of abortions.

Among the adult descendants I have noted a fair number of paranoiacs, cases belonging to the dementia praecox group, and other types of organic and functional disorder. On the other hand, a not infrequent record of exclusively sound children could be obtained. In one instance of paralysis in a parent, there were seven healthy children and no miscarriages.

The very marked influence of a paralytic parent is well illustrated by the case of a man who previous to infection had three healthy children by his first wife; by a second wife, after contracting syphilis, he had no issue.

By way of further illustration, let me now present to you a string of genealogic examples in which the paralytic descendants exhibit various forms of heredity.

1. A case of mediate dissimilar heredity; paternal and maternal grandmother insane; father's sister insane; parents healthy; son general paralytic (had a stillborn child).

In the next two instances there is an uniterrupted chain of heredity;

2. Grandfather insane; father imbecile; son general paralytic.

3. Maternal grandfather insane ; father insane ; maternal aunt epileptic ; son general paralytic.

The following case is one of mediate heredity revealing itself in four sons :

4. Grandfather insane, committed suicide ; parents healthy. Four sons suffer from mania, alcoholism, nervousness, and general paralysis respectively, the latter having had syphilis.

Instances of this kind are by no means rare.

An epileptic father, for example, had two sons, one an imbecile, the other a general paralytic.

There are, doubtless, paralytics innocent of any demonstrable ancestral taint, as exemplified by the following instance : Grandparents on both sides healthy ; parents healthy ; son general paralytic.

Of still greater moment are cases of homologous heredity, and such where several brothers, sisters, or relatives exhibit the same type of insanity. Some cases in point, which I could easily multiply, are the following :

Father apoplectic ; maternal uncle general paralytic ; two sons general paralytics.

In the next four instances there was a paralytic father :

1. Four sons, of which two were general paralytics, and two insane.

2. Three sons, of which two were general paralytics, and one committed suicide.

3. Two sons, of which one was a general paralytic, and one an epileptic.

4. Three sons, of which one was a general paralytic, one insane, and one peculiar.

In a fifth case, both parents and the only son were paralytic, and in a sixth a tabetic father had a paralytic son.

It is worthy of note that in quite a number of these "homologous" cases both ascendant and descendant had a clear history of syphilis.

Now, all these examples forcibly point to an inherited disposition, of which in some families all descendants participate, and which undoubtedly increases the chance of syphilitically-infected descendants to develop paralysis.

Although general paralysis is an acquired disorder which is never propagated to posterity—with the necessary exception of the juvenile form—there are conclusive reasons for assuming that in all individuals burdened with heredity the parental germ cells may be adversely affected, and so encourage "parasyphilitic" changes in the infected offspring, this being particularly true in instances of homologous heredity.

It would also appear that in certain families there is an uncommonly high degree of predisposition for the parasyhilitic sequelae of specific poisoning.

A leading role must be imparted to evironmental agency in those types of insanity induced by alcoholic indulgence, to which we now pass on. I have inquired into the history of 556 cases whose insanity was attributed to steady abuse of intoxicants, of which number 494 were males. The main facts elicited are an enormous prevalence of homologous—namely alcoholic—heredity, a rather low rate of hereditarily untainted individuals, and an intermediate proportion of dissimilar heredity. Apart from the numerous inebriates walking in the intemperate footsteps of their progenitors, I have found among the descendants instances of true paranoia, katatonia, dementia praecox, epilepsy, imbecility, and quite a fair sprinkling of organic cerebral disorders, including general paralysis.

The younger alcoholic offspring exhibits a serious record of early epileptic fits, shortened vitality, and idiocy. With respect to the incidence

of miscarriages, stillborn children, and sterility, much smaller figures have been obtained than those encountered in the families of the paralytic parent; occasionally luetic antecedents in this class of alcoholic families were ascertainable.

The association between alcoholism and epilepsy is a very close one. In III instances fits were developed in the course of an intemperate life, the time of onset varying between 2 and 41 years after drink was started. Illustration of the different types of heredity in habitual inebriates is furnished by the following examples:

1. A case of dissimilar mediate heredity; great-grandfather, grandfather two paternal aunts, and one uncle insane; parents healthy; son alcoholic.

2. A case of mixed immediate heredity; father alcoholic; mother epileptic; son alcoholic.

3. A case of cumulative homologous heredity; great-grandfather, grandfather, father, and son alcoholic.

The evidence of clinical experience therefore discloses the fact that the majority of habitual drinkers have a neurotic history, and that the severity of the heritage is more prominent in those having a direct alcoholic ancestry. Moreover, clinical study does not support the suggestion that the acquired habit of drink or even any craving is transmitted, but the inference is rather in favour of the germ cells being so modified as to render the offspring particularly liable to the injurious influence of Alcohol. Some of the alcoholic descendants are congenitally intolerant. If the mother be addicted to drink additional damage may be done to the soma during intrauterine life.

I agree with Dr. Robertson that there is an inheritance of environmental influences. If it were possible to transfer all the offspring of alcoholic parentage into a healthy and moral atmosphere, and to wisely regulate their lives in every respect, the number of chronic alcoholics would be rapidly reduced in spite of adverse hereditary antecedents. Alcoholism, we may take it, is largely the product of environmental agency, based on a neurotic diathesis. No other form of mental irregularity is to the same extent dependent on the environment. The intimate connexion between alcoholism and epilepsy leads us now to the consideration of the latter affection.

Idiopathic epilepsy is the type of mental disorder which discloses the disastrous consequences of heredity perhaps more distinctly than any other nervous condition. We frequently encounter veritable family endemics. In one of my observations as many as ten children suffered with fits. Epileptics, like alcoholics, exhibit also in numerous instances a record of dissimilar heredity traceable through several generations:

The following are characteristic examples of cumulative heredity in epileptics:

1. Paternal grandmother insane; mother neurotic; son epileptic.

2. Paternal grandfather alcoholic; maternal grandfather and mother insane; son epileptic.

3. Grandfather and father apopletic; son epileptic.

Sometimes there is an alternation of homologous and dissimilar heredity in grandparent and parent, for example:

Maternal grandmother epileptic; father alcoholic; son epileptic.

Or we note homologous heredity of a cumulative description as in the following observations;

Paternal grandfather, paternal aunt, father, epileptic; mother consumptive; three children epileptic.

In passing, I want to remark that in my opinion ancestral tuberculosis is of some hereditary importance generally, and distinctly so in the his-

tory of idiocy and infantile cerebral paralysis, in assisting the formation of neuropathic disposition.

In cases of acquired epilepsy subsequent to cranial traumatism or infectious fevers, there is a large proportion with a neuropathic history. Among those with an apparently clean bill of heredity I have not met with a single instance where the acquired disease was manifestly handed down to the offspring.

We may, however, assume that in idiopathic epilepsy the germ cells are so seriously modified that even without any additional environmental influences on the soma the inherited disposition is duly developed. Sound hygienic conditions will, it is true, often reduce the number and intensity of the attacks, and injurious extraneous agents may aggravate the patient's condition, but otherwise environmental factors in essential epilepsy are probably not operative.

With regard to post-traumatic neuroses, I have likewise no positive proof of hereditary transmission. Respecting the group of senile dementia and other types of insanity due to arterio-sclerotic changes, we find a frequent hereditary predisposition for atheromatous degeneration. Instances of homologous heredity are distinctly rare in senility; sometimes several brothers and sisters are identically affected.

My closing remarks shall touch the large class of functional psychoses. I can afford to be very brief, chiefly by reason of the fact that clinical testimony of transmission of acquired characters in this group is absolutely negative.

Paranoiacs, and most sufferers from the other types of functional disturbance—namely, dementia præcox, katatonia, mania, melancholia, the recurrent forms of insanity, and hysteria—show a more or less powerful hereditary disposition to insanity and other nervous disorders. Apparently hereditary modification or the germ cells in one respect is of a twofold nature. Sometimes—take a typical case of essential paranoia—the morbid character of the germ cell will probably develop at one time or other in the face of the most favourable surrounding factors, while in other cases—for example, in the litigious type of paranoia——environmental agents, such as disappointment over a lost law-suit, may give instigation to a gradually-progressive development either of a dormant disposition or of a rudimentary disorder hitherto less conspicuous, and perhaps of a stationary character. The same applies to the different forms of insanity connected with child-bearing and the climacteric period, where there are numerous factors which may act as exciting causes.

Regarding the incidence of homologous heredity in the various types of functional psychoses, it is impossible, according to my experience, to formulate any definite law at the present moment. There are examples of homologous heredity in every class. As far as I can judge, however, transformation is more frequently the rule.

Summing up, I may say that, generally speaking, clinical experience does not clash with the results of Dr. Beard's investigations. There is, first, no clinical evidence of acquired mental abnormalities being transmitted to the offspring. It is, secondly, highly probable that—to quote Dr. Beard—the influences of the environment are reflected on the germ cells. Thirdly, the hereditary potentialities of the germ cells may in some cases develop in early or later life, unaided by any traceable environmental influence; in other cases they certainly remain dormant or in a rudimentary state of development until roused to life by inimical extrinsic factors.

APPENDIX TO GENEALOGIC TABLES.

A.—*Dementia Praecox.*

(*a*) Parents healthy (father's brother epileptic) : two daughters epileptic ; two sons dementia praecox.

(*b*) Parents healthy (father's sister infantile cerebral paralyses mother's sister epileptic ; son dementia praecox.

(*c*) Grandfather suicide ; parents healthy (mother's brother suicide) ; son dementia praecox.

(*d*) Grandfather insane ; father simple ; daughter dementia praecox.

(*e*) Maternal grandfather insane ; father insane ; mother suicide ; daughter dementia praecox.

(*f*) Paternal grandfather diabetes ; maternal uncle diabetes ; mother's two sisters epileptic and insane respectively ; daughter imbecile and dementia praecox.

(*g*) Parents healthy ; father's brother epileptic ; mother's sister insane ; daughter dementia praecox ; son suicide.

(*h*) Great-grandfather, grandfather, father, alcoholics ; daughter dementia praecox.

(*i*) Grandfather insane ; father insane and alcoholic ; daughter dementia praecox.

(*k*) Grandfather and father, phthisis ; daughter dementia praecox.

(*l*) Great-grandfather suicide ; grandfather suicide ; mother insane ; daughter dementia praecox.

(*m*) Grandfather insane ; father normal ; two sons dementia praecox.

B.—*Recurrent Insanity.*

(*a*) Maternal grandfather insane ; maternal granduncle insane ; father insane ; two descendants recurrent insanity ; one insane.

(*b*) Great grandfather and grandfather alcoholic ; parents healthy ; two paternal cousins insane ; one daughter recurrent insanity.

(*c*) Maternal grandfather insane ; maternal uncle insane ; father insane ; two descendants recurrent insanity ; one insane.

C.—*Paranoia.*

(*a*) Father alcoholic ; father's brother and sister phthisis ; mother paranoia ; daughter paranoia (communicated from mother.)

(*b*) Grandfather alcoholic ; father imbecile ; two descendants paranoic and choreatic respectively.

Great-grandmother insane ; mother imbecile ; one descendant paranoiac, one insane.

(*d*) Maternal grandmother insane ; mother imbecile ; one descendant paranoia, one insane.

(*e*) Grandmother neurotic ; parents healthy ; three daughters paranoia.

(*f*) Paternal grandfather insane ; father alcoholic ; mother neurotic ; son paranoia.

(*g*) Maternal grandmother suicide ; father suicide (paternal uncle insane) ; daughter paranoia.

(*h*) Grandfather alcoholic ; parents healthy (maternal brother alcoholic) ; son paranoia.

(*i*) Maternal grandmother paranoia ; parents healthy ; one son paranoia, one insane.

(*k*) Paternal grandfather suicide ; father suicide ; one son paranoia, one son imbecile.

(*l*) Mother paranoia ; one son paranoia, one epileptic.

(*m*) Parents healthy ; father's brother and mother's brother insane. one son paranoia.

(*n*) Maternal grandmother suicide ; mother criminal ; one son paranoia, one alcoholic.

D.—*General Paralysis.*

(*a*) In father and descendants: (1) Father and one son, 10 cases; (2) Father and two sons, 3 cases.

(*b*) In two brothers, 13 cases.

(*c*) In mother and son, 2 cases.

(*d*) In other relatives of paralytic patients: Mother's brother general paralytic, 2 cases.

E.—*Non-paralytic Heredity in Grandparents.*

(*a*) Paternal and maternal grandmother insane; parents healthy; father's sister insane; one son general paralytic; one son insane; one daughter peculiar.

(*b*) Father alcoholic and epileptic two sons general paralytics.

(*c*) Father alcoholic; one son general paralytic, one dementia senilis.

(*d*) Grandfather insane; father imbecile; son general paralytic.

(*e*) Father epileptic; one son general paralytic; one son imbecile.

(*f*) Mother's brother insane; parents healthy; one son general paralytic; one paranoia, one suicide, one alcoholic.

(*g*) Father apoplectic; one son general paralysis; one son tabes.

(*h*) Grandmother and mother insane; son general paralytic.

(*i*) Maternal great-grandmother and mother's sister insane; son general paralytic.

F.—*Epilepsy.*

(*a*) Paternal grandmother insane; mother neurotic; son epileptic.

(*b*) Paternal grandfather alcoholic; maternal grandmother insane; parents healthy; son epileptic.

(*c*) Paternal grandfather and father apoplectic; mother dementia senilis; mother's brother epileptic; son epileptic.

(*d*) Maternal grandmother epileptic; father alcoholic; son epileptic.

(*e*) Paternal grandfather epileptic; father alcoholic and epileptic; paternal aunt epileptic; mother phthisis; three descendants epileptic.

(*f*) Paternal grandfather suicide; father alcoholic; paternal aunt insane; two descendants epileptic.

(*g*) Maternal grandfather epileptic; father alcoholic; mother's brother epileptic; son epileptic.

(*h*) Grandfather and father alcoholic; son epileptic.

(*i*) Grandmother epileptic; father alcoholic and epileptic; son epileptic.—*Brit. Med. Journal*, Oct. 15, 1904.

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