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QUEEN'S MEDICAL QUARTERLY is presented to the Medical Profession with the compliments of Queen's Medical Faculty. Contributions will be gladly received from members of the Profession and promptly published.

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EDITORIAL.

READERS of the QUARTERLY have no doubt learned from the daily press that representations have been made by the Faculty and its friends to the Ontario Government for a grant in aid of Medical Education in Kingston.

On Dec. 9th last a deputation waited upon Mr. Whitney and his ministers and asked that a School of Biology and Public Health should be established in connection with Queen's under a chartered Board of Governors. \$75,000 was asked to erect a suitable building and \$7000 a year to maintain and equip it and to pay for work done for the Provincial Board of Health.

Our claim for consideration is based, first of all, upon the fact that a large sum has recently been granted to promote medical education in Toronto. As this is a departure from the educational policy of the past, the Faculty of Queen's naturally asks for proportionate consideration for what has been done in Kingston for the past fifty years.

The School had a very natural origin as a result of certain disabilities which were placed upon medical students in Toronto in the way of religious tests. During all these years it has done its share of the work of medical education. At first the

Faculty was a corporate part of the University. Then for some years it was carried on under the charter of the Royal College of Physicians and Surgeons, but since 1892 it has been a Faculty of the University operating under a constitution granted by the Board of Trustees. Its finances are independent of the general revenues of the University.

There are about fourteen hundred graduates, many of whom have attained distinction. The Dean of the Faculty of Medicine in Toronto University and the Dean of the Faculty in Winnipeg are graduates in medicine of Queen's University.

The attendance has been over two hundred for several years. It is still increasing and now taxes our accommodation, especially in the laboratories, to the utmost. The Faculty consists of twenty-five men, of whom four devote all their time to teaching. In no other school in Canada is there a professor who devotes all his time to Anatomy. This has always been most efficiently taught in the school.

The physicians who have formed the Faculty have exercised much self-sacrifice to keep the school going and to maintain its efficiency. In the early days there were not many students, and the fees barely paid expenses. When the number of students increased the development of medical science required the equipment of laboratories and the employment of fully paid teachers, so that there has been plenty of work and but little remuneration for the professional men of the Faculty.

After all this has been done it is not presumptuous to assume a vested interest in medical education, which is not to be ignored if provincial funds are to be expended for the advancement of like interests in Toronto.

In the second place our claim is made because of the work which we are doing directly for the government and for the community in a very practical way. The Professor of Pathology and Bacteriology is a special officer of the Provincial Board of Health and makes free examinations of pathological products and of water sent to him by physicians and local Boards of Health. This work is done in our laboratories and is of the greatest value to the public. The early diagnosis of diphtheria, of typhoid fever, of tuberculosis and other contagious diseases, and the determination of the purity of water, are of

the utmost importance to the people generally. As our Pathologist is regarded one of the best authorities in Canada in his department much work comes to him from outside the immediate district, and it has all been done promptly and with the greatest satisfaction to those needing his assistance.

Nor is this the only work done for the country in our laboratories and by our experts. Nothing has contributed more to the prosperity of the eastern portion of Ontario than the progress of the Dairy interests. The Dairy School at Kingston has been a chief factor in this progress. Now all the scientific work of this school has been done in our laboratories and by our Pathologist. The students of the dairy school are instructed in our laboratories, and the cheese-makers throughout the country send for our expert when they get into trouble. All the cultures and ferments for the factories are prepared in and supplied from our laboratories. It is impossible to estimate the value of this work to the province, and its importance is growing every year.

In the department of Biology also the services of the Professor have been extended far beyond the instruction of arts and medical students. Valuable research work has been done for the government in connection with the question of pollution of streams by sawdust and chemicals and its effect upon fish life; with the question of the killing of fish by dynamite; and with the dog fish problem.

Surely the nature of this work and the possibility of its expansion constitutes a claim for public assistance. There is nothing of greater importance than the health of the people, and this is directly dependent upon the condition of medical education. The propositions however, affect the material interests of the county in no slight degree. With the advances constantly being made in methods, it is utterly impossible to meet the growing expenses and to provide new equipment out of the fees of the students who are already taxed much higher than those in other departments of professional study.

It is not expected that for the purposes indicated a grant will be made directly to the Medical Faculty. It is suggested that all this work shall be transferred to, and carried on by a School of Biology and Public Health under a chartered Board of

Governors and in affiliation with the University. This Board will administer the grants from the Government and regulate the affairs of the School. A suitable building with class rooms and laboratories for Biology, Physiology, Pathology, Bacteriology and Pharmacology can be erected for about \$75,000, and to supplement the fees of the students, it is estimated about \$7,000 a year will be needed.

The Faculty is confident that these proposals will be favorably considered by the Government. At the interview to which reference has been made Mr. Whitney expressed his sympathy with the work being done by Queen's University in its various Faculties and Schools, and he recognized its force in the higher education of the province.

Surely Ontario is large enough and rich enough to provide properly for its growing educational needs. With half a million dollars of succession duties coming out of one estate in this part of the province, it seems a small thing to devote the amount suggested to the promotion of medical education, and this is the more evident when the the source of that estate is taken into consideration.

PARACELSUS.

THE early part of the sixteenth century is remarkable for many things. The revival of learning had come with the study of the literatures of ancient Rome and Greece. Latin was the language in which the learned of Europe conversed, wrote and lectured. It was also the language of the church, not all churchmen being so ignorant of it as the priest who hearing the pious ejaculation, "St. Benedictus benedicat," added seriously, "St. Bernhard bernhardat." It was the time of Da Vinci, Michaelangelo, Raphael, Corregio and Titian; of Ariosto and Scaliger; of Copernicus; of Luther and Erasmus; and of the great world navigators who were following up the

discoveries of Columbus. The invention of printing in 1452 had provided for the more rapid dissemination of ideas. The Reformation came and brought with it an atmosphere in which every human activity flourished. The weary old world renewed its youth. The three great rulers, Henry VIII, Francis I and Charles V were born near the beginning of the century and began to reign before they were of age. Luther, Melancthon and Loyola were their contemporaries in age. So were Raphael and Tasso.

Into this world of fermenting ideas, seething politics and religious unrest was born one who is best known in history as Paracelsus. The place of his birth was Maria-Einsiedeln, near Zurich, in Switzerland. The date is a little uncertain, but it was between 1491 and 1495, probably in 1493. (Loyola was born in 1495, Luther in 1483.) His father was William Bombast von Hohenheim, a physician of noble descent. His mother was superintendent of the hospital at Einsiedeln. From his father, Theophrastus—this seems to have been the real name of our hero—received his early education, which was naturally strongly tinged with medicine, alchemy, astrology and chemistry. Einsiedeln was then, as now, a large village (now about 8,000) celebrated for its monastery, which even in those days of religious decay appears to have been the abode of some men of learning and sincere religion. The young lad, by his brightness and originality, seems to have attracted their attention; and, both in these early days, and later, when the family removed to Austria, these kindly churchmen instructed him in the learning of the day. He particularly mentions Bishop Tritheim, of Würzburg, as having taught him chemistry and alchemy. Tritheim is the author of tracts on the elixir of life, &c. In 1502 the family went north to Villach, in Carinthia (Austria), where the elder Bombast practised medicine until his death in 1534, only seven years before the early death of his son. At the age of sixteen Theophrastus entered the great Swiss university at Basle, but he does not seem to have taken kindly to university life, as we find him a little later pursuing the study of alchemy and astrology under the guidance of such teachers as Bishop Tritheim. He now seems to have joined the ranks of the "poor scholars", who roamed from college to

college, and from monastery to monastery, seeking to increase their store of knowledge by conversation with learned men and by listening to their lectures, in the meantime picking up a living as best they could. He declares that he visited the chief universities of Italy, France and Germany and graduated as Doctor of Medicine. Having convinced himself that little was to be learned from books and from men who confined their study to books, he then joined himself to the wealthy family of Fuggers, of Augsburg, and visited their mines in the Tyrol to study the origin of the metals at first hand. That he here made good use of his time can be seen on examination of his book on *The Economy of Minerals*. He now seems to have felt himself in contact with something real. He was impressed with the struggle with nature which was necessary before the precious metals could be won, and he became more and more convinced of the importance of actual personal observation. In his works he again and again returns to this idea, that positive knowledge of nature was not to be got in schools and universities, but only by going to those who were constantly engaged with her. In carrying out this idea of education he spent much time in studying the operations of mining, the nature of minerals and rocks, the action of water, and the accidents and diseases of the miners. He visited and studied smelting works and manufactories; he talked with all kinds of men, ever seeking to get the results of their own experience. He thus came to attach little value to mere scholarship. To adopt with him the methods of the disputatious schoolmen was like fluttering a red rag before a bull. Again and again he puts down his head and charges furiously upon such pedantic opponents. His writings abound in examples of this explosive wrath. After leaving the Tyrol he seems to have wandered over all Europe carrying out his idea of education. In Poland he was captured by a marauding band of Tartars and carried to Samarcand, the famed seat of Eastern learning and commerce. There he imbibed the spirit of Eastern mysticism everywhere to be found in his works. He seems to have won the favour of the ruling family by some remarkable cures and to have been taken to Constantinople. In 1526 he returned to Switzerland as a reformer of science and medicine, and as a wonder-working phy-

sician. He went to Basle, the scene of his early venture in university study. Here he was so fortunate as to cure of some disease Frobenius, the printer, who recommended him to Ccolampadius. By the latter's influence he was appointed to the chair of medicine and chemistry in the university. He was thus the first professor of chemistry on record. His inaugural lecture reveals many characteristics of the man as well as his theory of education. I, therefore, give a somewhat lengthy extract. It is dated at Basle, the nones of June, 1527:

"It is not a degree, nor eloquence, nor a faculty for languages, nor the reading of many books, although these are no small adornment, that are required in a physician; but the fullest acquaintance with subjects and with mysteries, which one thing easily supplies the place of all the rest. For it is indeed the part of a rhetorician to discourse learnedly, persuade and bring over the judge to his opinion; but it behoves the physician to know the genera, causes and symptoms of affections, to apply his remedies to the same with sagacity and industry, and to use all according to the best of his ability. But to explain the method of teaching in a few words, I must first speak of myself. I, being invited by an ample salary of the rulers of Basle, for two hours in each day do publicly interpret the books both of practical and theoretical medicine, physics and surgery, whereof I myself am author, with the greatest diligence, and to the great profit of my hearers. I have not patched up these books after the fashion of others from Hippocrates, Galen or any one else; but by experience, the great teacher, and by labor have I composed them. Accordingly, if I wish to prove anything, experiment and reason for me takes the place of authorities."

He then lighted some sulphur in a pan, and to these Tartarean flames he consigned the works of Galen, Avicenna, Averrhoes and Aristotle, to the amazement and horror of his audience. Books were expensive and prejudices strong in those days! Browning puts into his mouth a probable explanation of this act:

"Here's a case now,

Why I answer not, but burn
 The books you mention. Pray does Luther dream
 His arguments convince by their own force
 The crowds that own his doctrine? No, indeed!
 His plain denial of established points
 Ages had sanctified and men supposed
 Could never be oppugned while earth was under
 And heaven above them,—points which chance or time
 Affected not,—did more than the array
 Of arguments which followed. Boldly deny!
 There is much breath-stopping, hair stiffening
 Awhile; then amazed glances, mute awaiting
 The thunderbolt which does not come; and next

Reproachful wonder and inquiry ; those
 Who else had never stirred, are able now
 To find the rest out for themselves, perhaps
 To outstrip him who set the whole at work."

Paracelsus has recorded his own opinion on the subject of the Reformation as follows :—"Had I time to meddle with such matters I would send both the Pope and the Reformers to school."

He astonished his hearers by another departure from the accepted fashion ; he lectured, not in Latin, but in the vulgar tongue. His teachings were received with the utmost enthusiasm, and his class room was crowded daily. But his popularity soon began to wane and his students gradually deserted him. It is very difficult to get at the facts and to decide how much of his loss of popularity was due to his own indiscretions and how much to the malice of the Galenists. Up to this period he was a man of unusually abstemious habits ; but he is now charged with habitual intoxication. According to one biographer, he spent his nights carousing in low taverns. He rarely lectured that he was not drunk ; he was drunk when he visited his patients, and drunk when he wrote his books. Such accusations are more easily made than refuted. Berdoe concludes, after a careful examination of the evidence, that they are, at least in large part, due to the malice of the older doctors whose traditional methods had been brought into disrepute by the common-sense practice of this brilliant new-comer. The incident which led to his break with Basle is characteristic. A certain canon of the cathedral, tormented with the gout, offered Paracelsus 100 florins if he would relieve him. The cure was effected, but the canon in health repented of the promise made while he was in pain. Paracelsus had recourse to the law. The magistrates in their wisdom decided that the canon should pay only the value of the medicines he had taken ! Paracelsus denounced the court in a speech which one would like to have heard. His writings show that he had a fine gift in phrases ! He resigned his position and quitted Basle in disgust.

He then resumed his wandering life accompanied by a few scholars attached to him by ties which misfortune could not break. He finally, in 1538, reached Villach, his home during

much of his boyhood and the death-place of his father, for whom Paracelsus seems to have had a deep affection. Here he published his "De Natura Rerum." From Villach he was called to a comfortable position by the prince-bishop of Salzburg, but not to enjoy it long. He died in the hospital of St. Sebastian on Sept. 24th, 1541, only 48 years of age. The bishop gave him honourable burial and erected a monument to his memory.

Few historical characters have been more variously estimated than Paracelsus. This is due to two causes, (1) the manysidedness of the man, and (2) to the bitter hostility of the Galenist doctors, whose fees he threatened by his teaching and practice. They charged him with attending the poor without fee! But while he made bitter enemies, he also found many warm friends, as witness the correspondence with Erasmus, the disciples who shared the poverty of his later days, the monument to his memory, and the rapid succession of editions of his works. Erasmus sought his aid, and declares in an interesting correspondence, which has been preserved, "you brought me from death to life". He has been called the prince of quacks, but "the quack dies rich and respectable, and in four centuries is utterly forgotten." Paracelsus himself, in Book I of the Archidoxies, says: "Many teachers by following the ancient methods have acquired for themselves much wealth, credit and renown, though they didn't deserve it, but got together such great resources by simple lies." His manysidedness is very marked and makes him a puzzle—a riddle hard to solve. He was full of noble enthusiasms. His scientific insight was quick and keen, and his life shows that he had in an unusual degree the spirit of research. He was also endowed with the intuition which distinguishes the great diagnostic from the ordinary practitioner. The wonderful cures which he certainly wrought were due as much to these qualities as to the new and powerful medicines which his immense stores of information enabled him to use. His common sense revolted from the frightful messes of the Galenists and the Arabian polypharmacists. For these he substituted simpler medicines, and particularly recommended the active principles of drugs. He thus paved the way for the discovery and use of the alkaloids. His vivid imagination and philosophic insight raise his published works

far above the level of the ordinary detailed description of facts and processes. There is nothing of the dry-dust about Paracelsus. But his imagination often carries him away. His flights of fancy sometimes degenerate into what an unsympathetic reader might call 'drawing the long bow.' His ambition was enormous, and his vanity was perhaps a very conspicuous quality. He is, however, not singular, in that age, in talking and writing a good deal about himself. "Puffing" as a modern art is not done in the first person, but the newspapers abound in it. The difference is that Paracelsus and his contemporaries said and wrote plainly what they thought of themselves, as of everybody else. The great weakness of Paracelsus seems to have been his ungovernable impetuosity,—his lack of self-control. This led to those excesses which marred the influence of his great intellect, and which ultimately prevented him from taking the place for which nature had endowed him,—as the scientific leader of his age. In comparison with what he might have made it, his life must therefore be set down as a failure. But what a magnificent failure! He reformed medicine and originated a large part of the early practice and theory of chemistry; saw dimly the relation of the atmosphere to combustion and respiration; perceived the chemical nature of vital processes and thus laid the foundations of physiological chemistry; he originated the use of active principles of plants instead of the plants themselves; he showed that the idea of poisons is merely relative, and that by using small doses poisons may be employed as medicines; he showed that chemistry was an essential part of medical education; and he dominated the medical and chemical science not only of his own day but of several succeeding generations. In the words of Dr. Samuel Brown, "As strong-headed as Bacon, as inventive as Albrecht and Arnold, as indomitable as Sully, and as mighty an enthusiast as Basil Valentine, this man wanted the truthfulness of character which animated all his predecessors, and he fell." Sixty years after his death he is referred to by Shakespeare (*All's well that ends well*, Act II, scene 3,) his name being coupled with that of Galen, as if equally well known.

In order to prepare the mind for a short review of the

works of Paracelsus, it will be well to get our perspective by a glance at the writings of a great contemporary, or perhaps more correctly, a predecessor, Basil Valentine. It will thus be easy to show that the peculiarities of style which characterise the works of Paracelsus belong to the period rather than to the man. Valentine wrote his *Triumphal Chariot of Antimony* when Paracelsus was a boy, but it was not printed till a century later. The title is suggestive of the mystical, fanciful treatment of the subject, which is evident when we open the book. The boastfulness and vanity which are charged against Paracelsus appear also in the pages of Valentine's work. But in spite of these blemishes, the book is a valuable treatise on the properties of antimony and its compounds, and of their medicinal value, most of it new matter, the result of Valentine's own experiments and observations. But he often breaks out into scorn and invective, wild flights of imagination, theological disquisitions, and recommendations of himself and his writings, which will parallel anything to be found in the works of Paracelsus, with whom he shares a supreme contempt for the regular medical practitioner of his day. "What more would you have, my lord doctor? What say you, O expert surgeon? If I were to put to you some searching questions respecting the nature and cure of external wounds, I should find that there is in you about as much knowledge as there is in the brain of a cock on the title-page of a child's spelling-book." "If any one be opposed to my opinions, he will find a crushing reply in this work."

Valentine's description of "spirits" shows an interesting commingling of the older use of the expression by the Stoics to indicate the vital breath of things with the later idea of aerial beings or ghosts. But there is also a reference to the "spirits" of drugs. It is evident, however, that in Valentine's day the word, even when used in this connection, carried with it the idea of existences somewhat of the order of fairies, but not so well defined in the imagination. "Now there are different kinds of spirits which are partly visible and yet cannot be touched as the natural body of a man can be touched. Such are especially those spirits which have fixed their domicile in the elements, spirits of fire, light,—the aerial spirits which

dwell in the air ; watery spirits in the water ; terrestrial spirits or "earth men" in the earth, especially where there are rich veins of ore. These spirits have reason and sensation, are skilled in the different Arts, and can assume a variety of shapes Other spirits which cannot speak, nor exhibit themselves by their own power, are those which dwell in men and animals, in plants and minerals. They have an occult, operative life, and manifest themselves by the efficiency of their working ; when separated from bodies by our Art they have a most marvellous sanative virtue." This last class of spirits are the essences, quintessences, and elixirs, extracted particularly by the process of distillation, when the 'hot breath' or vapour often condensed into potent liquids. The works of both Valentine and Paracelsus are strongly tinctured with such doctrines. With them the life in all things is no mere metaphor.

The works of Paracelsus have been translated into English from the Geneva folio Latin edition (1658) by A. W. Waite. It is from this translation that I quote. In the book on the *Economy of Minerals* are to be found many passages showing the philosophy held by Paracelsus regarding life in all things. "Elements die as men die, on account of the corruption in them. So water at its death, as it were, consumes and devours its own fruits [minerals], so does the earth its own fruits [plants]. Whatever is born from it returns to it again, is swallowed up and lost, just as the time past is swallowed up by yesterday's days and nights, the light or darkness of which we shall never see again. It is no weightier to-day than yesterday, not even by a single grain, and will after a thousand years be of the same weight still. As it gives forth, so in the same degree it consumes." Thus Paracelsus foreshadowed the doctrine of conservation of matter.

In a chapter on *the death of the tree of minerals* he gives us a fanciful but suggestive theory of the origin of mineral deposits by the action of water, imagining the ore bodies as the branches of a tree which has its roots in the water. "So then, the first matter of minerals consists of water ; and it comprises only Sulphur, Salt and Mercury [the three alchemical elements, according to Paracelsus.] These minerals are that elements spirit and soul, containing in themselves all minerals,

metals, gems, salts, and other things of that kind, like different seeds in a bag. These being poured into water, nature then directs every seed to its peculiar and final fruit, incessantly disposing them according to their species and genera." Paracelsus had studied ore deposits and had their orderly arrangement to account for. His words seem like a metaphorical description of the modern theory of crystallization. The last sentence in this interesting chapter is characteristic. After referring to the clear vision of philosophers he bursts out with "But that Greck Satan has sown in the philosophic field of true wisdom tares and his own false seed, to wit, Aristoteles, Albertus, Avicenna, Rhasis, and that kind of men, enemies of the light of God and of nature, who have perverted the whole of physical science, since the time when they transmuted the name of Sophia into Philosophy."

For Paracelsus everything was alive, minerals as well as plants and animals; all had their body, soul and spirit, typified as the elements Sulphur, Salt and Mercury, of which all minerals and metals are composed, 'mysteriously comprehended in universal nature.' "Consider, I beseech you, this tiny grain of seed, black or brown in colour, out of which grows a vast tree, producing such wonderful greenness in its leaves, such variegated colours in its flowers, and flavours in its fruits of such infinite variety; see this repeated by nature in all her products, and you will find her so marvellous, so rich, in her mysteries, that you will have enough to last you all your life in this book of nature without referring to paper books. If God then shows Himself to our discernment in nature so powerful and so wise, how much more glorious will He reveal Himself by His Holy Spirit to our mind, if we only seek Him. This is the way of safety which leads from below to above. This is to walk in the ways of the Lord, to be occupied in admiring His works, and to carry out His will, so far as in us, or as it should and can be in us. This has been my Academia, not Athens, Paris, or Toulouse. After I had read many deceitful books of wise men, I betook myself to this one alone, from which I learnt all that I write, which also I know to be true. Still, I confess, there are many more things which I do not know, but which will surge up to the surface in God's own

time." "I would admonish my readers to put aside for awhile the mere dreams and opinions of others who romance about these things, until they see that they are only philosophers on paper, not in nature, who have been taught by men like themselves, and with the same amount of learning, *to think by rote and not by experience.*"*

The chapters on brine, salt, saltpetre and vitriol, when divested of my assm, show a close acquaintance with these substances. His test for blue vitriol is one in use at this day, viz., its power of depositing copper upon a piece of iron. Paracelsus interprets this as the transmutation of iron into copper. "There is a fountain in Hungary, or rather a torrent, which derives its origin from vitriol; nay, its whole substance is vitriol, and any iron thrown into it is at once consumed and turned to rust, while this rust is immediately reduced to the best and most permanent copper by means of fire and bellows." This is a description of a process now in use for recovering copper from the drainage of copper mines and waste heaps.

He winds up his chapter on the sulphur of minerals with the remark, "Sulphur demands a very expert operator, not a mere boaster or charlatan." These latter are the words applied to himself by so many of his biographers!

These extracts show principally one side of Paracelsus,—the devout, ardent, patient student of nature. In his short tract on the *Composition of Metals* he reveals another and less attractive side. He describes *electrum* an impossible alloy of the seven metals, viz., gold, silver, iron, copper, mercury, tin and lead, made carefully at the conjunctions of the various planets; and, in discussing its virtues, writes as follows:— "There still remain in our age many necklaces and ornaments, such as rings, bracelets, remarkable coins, seals, figures, bells, shekels, made out of this, which of old were hidden in the earth. When they were dug up nobody, or very few, understood them, and in their ignorance they gilded them over, or tinged them with silver. It will be safest to pass over these matters in silence. Not, however, that we can altogether pass unnoticed certain stupendous effects of our *electrum*; since

*The italics are mine.

they came under our own eyes we shall be able to speak the more freely concerning them, without any suspicion that we are romancing or making up a story. We have seen rings, for instance, which removed all fear of paralysis or spasm from those who wore them on their fingers. If an epileptic patient put such a ring on the third finger, even although he be so overcome with the violence of the paroxysm as to be prostrated on the ground, he comes to himself and gets up. Here, too, should be added something which we do not give from the report of others, for the same we have seen with our own eyes and know by experience. If the above mentioned ring be worn on the third finger by a man in whom any ailment is latent and growing, so that it would presently break forth in an eruption, the ring would forthwith give an indication by breaking out in a sweat and, as if seized with a sudden sympathy, would put forth spots and become depraved in appearance."

He now becomes enamoured of his subject and adds a romance about a miraculous bell he saw in Spain, which its owner used to summon spirits and spectres, which Paracelsus asserts he saw him do many times. He has no doubt this bell was made of the marvellous electrum.* But to illustrate the subtlety of things and convince us that he is not romancing, this wonderful man refers to the now well-known fact that if gold or silver be suspended over mercury without touching it, the vapour of the mercury will at length amalgamate the precious metals and render them brittle. He concludes with a warning which is worth repeating: "It will now be for you to keep this great secret [of electrum] and mystery of Nature, and to take care that it does not fall into the hands of my adversaries; since it would be an indignity for them to get to know it. A pearl or a precious stone will not please a goose, because a goose does not know its price or value. It would infinitely prefer a turnip. We may fitly say the same of the Sophists."

In his book *Concerning the Nature of Things* he describes

*In another place Paracelsus tells us solemnly that he knew of a man who was nourished for years by a clod of earth placed upon his stomach and replaced by another as soon as it wasted away. One wonders if he did not say and write these things with his tongue in his cheek!

many interesting operations with which he must have been familiar. For example, the dissolving of gold by *aqua regis*. He notes the white residue (of silver chloride), and describes the crystallization of the chloride of gold under the figure of the growth of a tree. "You see the Sol rise in the glass and grow in the form of a tree with many branches and leaves." A flint taken out of river water may be made to grow by putting it in a cucurbite, covering it with 'its own water', distilling until dry, and repeating the operation until the stone fills the cucurbite. "In this way, by means of Alchemy, in a few days you will see that a very large stone can be made, such as the Archeus of the waters could scarcely make in many years. . . . Though this may be of no profit to you, still it is a very wonderful thing." He further shows his practical acquaintance with chemistry by writing of 'the enemies of metals', such as aqua fortis, aqua regis, sulphur, antimony, 'which spoils all metals with which it is liquefied in the fire,' quicksilver, which 'makes all metals immalleable and fragile'; but he often throws in things which are inaccurate, as, for example, where he states that mercury will make a steel rod as brittle as glass. In spite of such blemishes one cannot read these chapters without being convinced that they were written by a man with a wide first-hand acquaintance with the chemistry of his day.

His knowledge and skill as a medical man may also be inferred. He begins his treatise on medicine (The Archidoxies of Theo. Par.) with a book on 'The Mystery of Microcosm.' "We have wished to elaborate and write this memorial work of ours, that we might arrive at a more complete and happier *method of practice*, since there are presented to us those mysteries of nature which are too wonderful to be even thoroughly investigated." "And let no one wonder at the school of our learning. Though it be contrary to the courses and methods of the ancients, still it is firmly based on experience, which is mistress of all things, and by which all art should be proved." The critics of Paracelsus have made a great deal of his search for the *elixir vitæ*, but his writings show clearly that his idea was to find powerful medicines which should *conserve* the bodily strength and *prolong* life. "Nor let us think that we must die on some day sooner or later, or that it is derogatory that a

Christian should believe it possible to prolong life by medicaments created by God for that purpose.”—(*A Book Concerning Long Life*). “We should know that to keep the body in health just as many things have grown up as for taking away health. We can, by our daily food and drink, at one time injure our bodies, at another benefit them and keep them in health, according to our use or abuse of these things.” His ideas of the preservation of health and the prolongation of life are then just those of a sagacious modern physician. But there is this difference. Paracelsus is very near to the childhood of the race with its beliefs in spiritual existence in all things, in incantations, sorceries and untold marvels. His lively imagination and his gift of romance carry him far beyond the point at which a modern physician would stop. And yet his discussion of diseases due to our own imaginings and the imaginations of others working on ours comes very near our latter day beliefs about the influence of the mind on disease, hypnotism, &c., &c. But even when he enumerates and describes the medicinal substances with which he is acquainted, he plays to the gallery by throwing in references to *nenuphar*, *apostolic powders*, *oil of crystal*, *oil of beryl*, *stone of the philosophers*, and other occult things. It must be acknowledged, however, that most of these things are mentioned by Paracelsus as belonging to the Spagyric (or Alchemical) Art.

I am not able to judge the philosophy of Paracelsus, but it certainly is not the poor creature described by some of his biographers. No one can rise from a perusal of his works without great respect for his originality, his quick perception, and his gift of expression. He was well acquainted with many of the philosophic ideas handed down from Greece and Rome. His philosophy of nature is based on the four elements, earth, air, fire and water, the material representatives of which he extracts from all kinds of natural objects by processes of distillation, &c., which he had evidently carried out himself. He describes in a perfectly clear manner the fallacious experiment of converting water into earth. To explain how such a great variety of objects and substances could originate from so few elements he writes, “In this respect nature may be compared to a painter, who from some few colours paints an infinite

number of pictures, no one exactly like another." This sentence illustrates the three qualities of the mind of Paracelsus which I have just mentioned, and surely such a mind as this deserves a better fate than to be remembered in connection with the word "bombastic." Browning has given him fairer treatment, but I almost begin to doubt if even he has done him complete justice. He makes him say :

"Suppose my labour should seem God's own cause
 "Once more as first I dreamed,—it shall not balk me
 "Of the meanest earthliest sensualest delight
 "That may be snatched; for every joy is gain,
 "And gain is gain, however small. My soul
 "Can die then, nor be taunted—'What was gained?'"

But he does not fail to continue

"Nor, on the other hand, should pleasure follow
 As though I had not spurned her hitherto,
 Shall she o'ercloud my spirit's rapt communion
 With the tumultuous past, the teeming future,
 Glorious with visions of a full success."

But the last words Browning puts into the mouth of our hero satisfy me :

"As yet men cannot do without contempt ;
 It's for their good, and therefore fit awhile
 That they reject the weak and scorn the false,
 Rather than praise the strong and true, in me :
 But after they will know me. If I stoop
 Into a dark tremendous sea of cloud,
 It is but for a time ; I press God's lamp
 Close to my breast ; its splendour soon or late
 Will pierce the gloom ; I shall emerge one day."

W. L. GOODWIN.

THE TOXÆMIA OF PREGNANCY.

IN looking over a number of medical journals which had accumulated during the summer and autumn months, I was particularly struck with the large number of articles on eclampsia which appeared therein. And yet this disease, with its sudden onset and terribly fatal consequences, is not a new one. It has been studied and discussed as far back as the literature

of obstetrics can trace it. A perusal of these articles will give, perhaps, the best answer, viz. :—that we have not yet reached a true pathological conception of the factors which enter into its causation, nor are we yet fully agreed as to the correct methods to pursue so as to bring our patient through to a favorable termination, as comparative mortality lists show only too plainly. Much research work has been done along etiological lines which has already revolutionized opinions, and has had the effect, too, of giving rational explanations to other, hitherto, inexplicable complications.

It will not be found uninteresting to take a review of a few of the various causes, from time to time laid down and accepted as correct for the varied manifestation which lead up to and produce eclampsia. Rayer, in Paris, in 1840, and Lever, in London, in 1843, pointed out the frequency of albumenuria in eclampsia, and the impression gradually gained ground that disturbed renal function, associated with imperfect elimination of poisonous material, caused the disease, and that urea was the noxious element.

In 1851, Frierich pointed out the resemblance between the phenomena of eclampsia and those of the uremic convulsions of Bright's disease, and held that the conditions were identical. The cause of the poisoning he believed to be a decomposition product of urea, viz. :—carbonate of ammonia. This opinion has now been widely abandoned, since it has been shown that eclamptic phenomena may occur without albumenuria; that in a great majority of cases there has been no previous renal disease; that the renal changes which may be found are not constant and definite, but very variable, and often very slight and that the albumen sometimes appears only after the convulsions have begun.

Traube advanced the view that cerebral anemia and œdema were produced as the result of increased blood pressure and hydremia of the blood, the former being aggravated by labor pains, and the latter by the loss of albumen in the urine.

In 1878, A. McDonald put forth the view that anemia of the brain substance was the essential cause of convulsions, and that the anemia was due to the presence of excrementitious matter in the blood, the result of altered renal function.

In 1882, Halbertsma criticized the former views and stated that eclampsia was due to the increased intra-abdominal pressure, caused by the growing pregnant uterus interfering primarily with the ureters and secondarily with the kidneys. Following the publication of Doderlein of the results of bacteriological examinations many authors have thought the disease due to micro-organisms. It has been declared to be an acute infective disease introduced through the lungs; also to a latent or active microbic decidual endometritis. Quite recently it has been suggested that the condition is due to the lack of the thyroid hypertrophy which is normal during pregnancy, and a consequent insufficient supply of its product—iodothylin. This product is supposed to neutralize the toxins in the blood. This theory has not attracted much attention.

Within recent years the view has gradually gained ground that the most important factor in the production of eclampsia is an auto-intoxication, the poisons resulting from various sources within the maternal and fetal organisms. In the endeavour to determine the toxic agents experiments have been made with substances known to result from body metabolism. Thus Landois induced convulsions and coma by exposing the anterior and lateral convolutions of the brain and applying kreatin, kreatinin, dried urinary sediment, potassium salts and other material.

In 1887 Buchard advanced the theory of auto-intoxication, and tried to prove that eclampsia is an intoxication from imperfect action of various excretory organs, and that the poison damaged the kidneys. Planchu, in reviewing the auto-intoxication theory, says that the toxemia is due to the liver, and under the heading *toxemia of pregnancy* includes all the petty morbidities of the pregnant state, such as nausea, insomnia, somnolence, ocular troubles, neuritis, vertigo, headaches, etc. The severer conditions produced are vomiting, ptyalism, pruritus, edema without albumenuria, herpes gestationis, puerperal mania, pernicious vomiting and eclampsia.

Schmol believed the causes of eclampsia to exist in the placenta, that a substance of the nature of a fibrin ferment, the result of degenerative processes or metabolic changes going on in the placenta, circulated in the blood and caused the thrombosis and emboli in the lungs and heart. In 1884 Ahlfeld

expressed the opinion that it had its origin in the fetus, the toxin being formed there and in the placenta. He strengthened this opinion by arguing that the convulsions often cease when the child dies or is delivered. Herz, in an excellent article on the subject, lays down this axiom that the liver is primarily at fault, the outcome of functional paralysis. Along this line it is argued that, as it is the chief organ for the elaboration and purification of the blood, the greater the insufficiency the greater the disturbance of metabolism and the more rapid the disintegration of the individual. The kidney and spleen suffer after the development of this insufficiency, and the renal lesion, namely, pregnancy kidney, becomes the important determining factor in the commonest type of eclampsia, while the injury done to the spleen is held to be responsible for the development of the anemia or leukhemia in the post-puerperal period. Dr. James Ewing, working on the preceding foundation of Herz, claims that the hyperemesis and incoercive vomiting of pregnancy, as well as several other morbidities of the pregnant state, are due to the same cause.

J. Clifton Edgar, in his splendid work on obstetrics, defines the toxemia of pregnancy to be a state of the blood and metabolism arising from hepatic insufficiency to which the pregnant woman is strongly predisposed, expressed most commonly by trivial ailments (the petty morbidities of pregnancy), but exceptionally by serious, severe, or even pernicious affections, such as acute yellow atrophy of the liver, pernicious vomiting, eclampsia—conditions which, while once thought to have nothing in common, are now seen to be clearly related. Under the heading of *symptomatology* he classifies them as (1) gastro-hepatic, (2) urinary, (3) nervous, and (4) cutaneous. Under the heading *clinical types* he gives (1) the *fulminant* as expressed by acute yellow atrophy of the liver. This form has been known to cause death within twenty-four hours. (2) The *acute*, in which the first, or premonitory symptoms, consist of prostration, headache and vomiting. The second stage is expressed by restlessness, agitation, insomnia, mental confusion, maniacal excitement and delirium. The third and terminal stage is one of apathy, hebetude, somnolence, stupor, coma and death. In some instances, from the intensity of the

toxemia, the second stage is not in evidence, the patient passing into the terminal stage at once. The characteristic of this form is its unexpected appearance and extreme fatality.

(3) The *subacute*. This is by far the commonest variety; the others may, fortunately, be said to be very rare. In this type death is not inevitable. Its chief manifestations are expressed clinically as hyperemesis, incoercible vomiting and eclampsia.

Partridge (American Journal of Obstetrics) says:—"Probably one of the most commonly accepted theories and which, to the ordinary mind, appears to explain best the whole condition is as follows:—It is the outcome of the action of the toxins elaborated in the organism by metabolism, and either produced in excess, and not sufficiently destroyed through faulty metabolic processes, or retained through deficient action of the kidneys, skin and other emunctories. It is well known that the process of metabolism produces certain substances which are distinctly harmful to the system. These are disposed of in two ways; first by the activity of the spleen, liver and other organs, and second by elimination. If suddenly or slowly either of these functions fails in its duty an auto-intoxication will result and the system will suddenly or slowly be overwhelmed with these metabolic processes and toxemia will result." This seems to explain the diversity of the pre-eclamptic symptoms. To say eclampsia may appear like a flash of lightning out of a clear sky is the result of a misconception of this generally accepted theory. Undoubtedly it seems to come on with awful suddenness, but if the patient had been carefully watched some symptoms would have been evidenced. Cases have been reported in which albumen has not appeared in the urine until the first eclamptic seizure; others in which diminution in the amount of urine has not been observable until a very short time before the eclamptic attack. In such and similar cases other emunctories may have been at fault, or the break down in the emunctories may have been sudden and complete, and the system thus suddenly overwhelmed with the toxins; or possibly there have been mild changes in the process of metabolism but insufficient to produce appreciable symptoms, until, from some exciting cause, these changes suddenly became so marked as to be overwhelming and an attack was precipitated.

On the other hand there are cases which give symptoms of toxemia, an hydremic appearance, swollen face, puffy eyelids and, perhaps general anasarca, albumen in abundance in the urine, cast, some ocular symptoms, and yet they go on to full term without an eclamptic attack. In such cases the emunctories have been able to perform the necessary work, or the changes in metabolism remained mild, or probably both. Possibly the accumulation of toxic material in the system was slow, and before the conditions necessary to produce an attack of eclampsia had been reached parturition had taken place. Between these two opposite, and perhaps typical conditions, a number of varieties exists of varied intensity and duration, modified by the degree of toxic material present, the suddenness of its formation and the inability of the emunctories to eliminate it.

It will now be in turn to ask what symptoms would lead one to consider a toxemia serious, or threatening, and what not. After a woman has had a convulsion the diagnosis is easy enough, but it should be made sooner, and it is by this early recognition of serious symptoms we can hope to have better results. That eclampsia is a preventable disease in all cases is hardly possible, but it is in a very large majority of cases.

While urinary examinations may at times give negative results, these cases are very exceptional, and it may be accepted as a general fact that sometime before an attack (it may be weeks, days or hours), the urine will be diminished in amount, highly colored, will contain albumen in large or small quantities and casts, and there will be a diminished amount of urea. Nausea and vomiting, frontal headache, disturbances of vision, irritability and other nervous disturbances, especially when accompanied by changes in the urine should be looked upon with dread and at once a careful investigation made. In regard to the information derived from blood pressure experiments with the sphygmograph show that eclampsia is accompanied by a very high blood pressure. While this is scarcely a very practical means of diagnosis it is as well to note the condition of the pulse. The educated finger can often make out a decided change in the radials; their tension is evidently increased, being hard, tense and resistant to the finger.

Sudden diminution of urine, perhaps amounting to almost suppression, presence of albumen in varying amounts, with hyaline and granular casts, in very acute cases perhaps blood cells, frontal headache, disturbance of vision, progressive loss of sight and dullness of intellect are signs that danger is right at hand and interference of the most active nature called for. On the contrary a patient with albumenuria and urinary casts, but with a free discharge of urine, a normal, or nearly so, percentage of urine, good action of the bowels and skin and intellectual, ocular and gastric functions unimpaired may be considered safe, but only as long as they remain so under careful watching.

In the consideration of the treatment three divisions must be recognized :—(1) The preventitive or prophylactic. (2) The management when toxemia has shown itself to exist. (3) When an eclamptic attack seems inevitable or has already occurred.

Every man whose practice is such that he may be called upon to attend obstetrical cases should have in mind a definite outline of treatment, with such variations as may be suitable to the conditions existing in any given case. In the treatment prophylaxis stands pre-eminent. The diet should contain a minimum of nitrogenous substances, and all food should be of the kind most easily assimilated. A strict hygienic life, outdoor exercise, frequent bathing, proper underwear and loosely fitting clothing around the waist. Attention to emunctories by an occasional dose of calomel, followed by a mild saline, varying it at times by some vegetable laxative; the use of water freely, plenty of rest and an avoidance of over-anxiety or worry about household affairs or other matters. Examine the urine frequently during the last two months and caution the patient to keep a careful watch upon the amount of urine voided, or the appearance of any unusual symptoms such as headache, gastric or visual disturbances, irritability of temper or oedema.

(2) In the presence of a well marked toxemia the amount of nitrogenous food should be diminished to a minimum. This can best be accomplished by an exclusive milk diet. As symptoms improve fish and white meats may be added. The production of poisonous material should be limited as much as

possible and their elimination hastened by stimulating the action of the bowels, liver, kidneys, skin and lungs. For this pure air and a large intake of water—three to five glasses between meals—must be insisted upon. When the case does not present severe symptoms out-door walks and gentle exercise may be allowed. Daily doses of colocynth and aloes at night, followed by a saline in the morning. Occasionally calomel may be substituted. The functions of the skin are to be stimulated by warm underwear, massage and warm or hot baths. Some preparation of iron, preferably Basham's mixture, is indicated. Glonoin is one of the very best drugs for stimulating the action of the kidneys and regulating arterial tension. In more severe cases of eliminative insufficiency the patient must be kept quietly in bed, removed from every source of irritation, trouble or annoyance—perfect physiological rest. A strict milk diet insisted upon and the eliminative organs stimulated to their full extent, using more active cathartics and more freely. The hot pack or hot air baths may be added and rectal injections of normal salt solution.

(3) When an attack of eclampsia seems almost inevitable, or an attack has come on, the case has assumed most serious proportions. The frequency of eclampsia has been variously estimated, as 1 to 250, 1 to 300, and 1 to 500. It is well established that it is far more frequent in primipara. Under the best treatment and surroundings, and with our modern studies as to its etiology, the mortality still remains very high. It has been variously estimated at from 20 to 30 per cent., while the infant mortality is over 50 per cent. The eclamptic tendency increases proportionately with the advance of pregnancy and is greatest about or at full term. On the other hand, in the presence of eclampsia, the maternal mortality decreases gradually as we pass from the ante-partum to the post-partum condition; the mortality in the ante-partum being 46 per cent., intra-partum 25 per cent., and post-partum only 7 per cent.

A disease with such high mortality becomes a matter of the most serious consideration, how best to treat the case and guide our patient to a favourable termination. Unfortunately opinion is widely divergent as to the management of cases

where eclampsia is imminent. Some assert that labor induced by the usual methods increases reflex excitability and precipitates convulsions, and the mandate is "take care of the convulsions and let the uterus take care of itself." On the other hand there are others, and they are in a large majority, advise induction of labor, under deep anesthesia, by some method that is rapid and that will cause as little injury to the patient as possible, while the continuation of the eliminative treatment is pushed to its full extent. In the presence of an ante-partum eclamptic attack the indications are:—(1) Control the convulsions. (2) Keep up the treatment for the elimination of the poisons. (3) Empty the uterus.

To control the convulsions four drugs stand out prominently, chloroform, morphia, chloral and veratrum viride. The relative advantages of each time will not permit me to discuss at length, but they may be grouped as follows:—

- (1) Morphia hypodermically supplemented by chloroform.
- (2) Chloral per rectum supplemented by chloroform.
- (3) Veratrum viride supplemented by chloroform.

The excellent action of veratrum viride is not as well known as the other three. It not only helps to control the spasm but reduces pulse rate and temperature, diaphoresis and diuresis are promptly effected, so that a triple effect is produced. With a rapid but strong bounding pulse the fluid extract may be given in 10m. doses and repeated until the pulse continues below 60. While under the influence the patient should be kept in the recumbent position as tumultuous heart action will probably supervene if the erect position is assumed. With a weak pulse veratrum viride is contraindicated. Chloroform is the most reliable agent for controlling the attacks, but it should be used sparingly and intermittently, and not continuously for hours, on account of the paralyzing effects on the lungs—one of the best excretory organs. Morphia has enjoyed great popularity since Veit emphasized its value. Undoubtedly it acts promptly and energetically, but its restrictive effect on the eliminative functions detracts much from its value, besides there is increased danger from its use during the stage of coma. Chloral, although acting more slowly than morphia, meets most of the advantages and is not exposed to the same objections. It con-

trols the convulsions and is far less toxic. It does not effect the secretions injuriously and can be continued for a long time. It lowers the pulse rate, reduces the temperature and lessens the blood pressure. From 30 to 40 grs. in mucilage or syrup, and repeated every four hours until the patient is under its influence thoroughly, may be administered.

For the elimination of the poison one large dose of calomel may be given, followed by magnesia sulphate so as to act on the bowels most thoroughly. Glonoin hypodermically, in good sized doses to act on the kidneys, and to encourage diaphoresis the hot air bath or hot pack. Normal salt solution by the rectum, or in the pectoral regions, acts most efficiently as an aid to elimination, acting both as a diaphoretic and diuretic, besides it has a stimulating effect on other organs as well as diluting the overburdened blood. Dry cupping over the kidneys may also be resorted to. Venesection in full blooded an plethoric women with full bounding pulse is of undoubted advantage. It should be sufficient to make a decided impression on the patient, and when this has been accomplished an intravenous saline can be administered with great ease and with much benefit.

3. Empty the uterus under deep anesthesia. This may be done (1) by Cesarian section, (2) by Duhrssen's incisions (vaginal section) and (3) by mechanical dilatation of the cervix. The first method has but few supporters; the second can only be recommended in cases where there is a rigid and almost cartilaginous cervix that will not yield to any form of dilatation. The popular method of the present day is mechanical dilatation of the cervix and the prompt extraction of the fetus either by forceps or version. Mechanical dilatation may be commenced, if necessary, by steel dilators, and progressive dilatation kept up by manual dilatation, Barnes' bags and Champetier de Ribes' bag.

In intra-partum eclampsia the obstetrician is relieved of the responsibility of deciding whether labor shall be induced or not, as labor has already been initiated. The way, then, is clear, the indications being to control the convulsions, eliminate the poisons and empty the uterus as rapidly as possible. In post-partum eclampsia there are only the toxemia and convulsion to combat.

R. W. GARRETT.

INTRA-TRACHEAL MEDICATION.

THE object of this article is to direct the attention of those not already familiar with them to the intra-tracheal injections in the treatment of certain forms of respiratory diseases, and to substantiate in a measure the claims advanced by those who believe that this method of treatment has a useful field of application.

As its name indicates, the procedure consists in the injection of medical fluids into the trachea and bronchi, whence they find their way by gravity and aspiration into the smaller bronchioles and probably the alveoli of the lungs, and are distributed throughout practically the entire lung area. That the respiratory mucosa will absorb as well as excrete is no mere fanciful theory, but an undeniable fact proved by the injection of colored fluids into the trachea of animals and the recovery of these, post-mortem, from the very periphery of the inferior lobes of the lungs. It may be objected that while this is undoubtedly true of animals, it does not necessarily follow that the same distribution is obtained in the human. However, even if the absorption is not as complete, the result aimed at it is accomplished in the topical application of medicaments to the respiratory mucosa and the betterment of the condition for which the treatment is instituted. That the effect of the drugs is distributed to all parts of the lungs may be inferred from the unsolicited remark of many patients after a successful injection, that he "feels cool down to here", indicating a point on his chest opposite the base of the lungs. The cooling effect is produced by the menthol contained in the solution. It may not be that the actual fluid finds its way as far as the air-cells, but at any rate the inspired air is medicated in passing over the injected fluid and acts as medicated vapour as far as the air itself goes, and probably the diffusion finally reaches the alveoli. Further, this action is not transitory, but continues for several hours after the injection, which is hardly the case with the vapor from a nebulizer. It will be pointed out later that the severe reaction spoken of in some works is a mere myth; that, indeed, the reaction is very slight; there is no spasm, no gasping for air, and little if any discomfort, and it seems to me that

the prolonged effect of the injection and the absence of reaction are to be explained in the same way, viz., that the only vehicle used to dissolve the medicines tends to adhere to the sides of the trachea and bronchial tubes and leave the lumen free, thus offering no obstruction to the entrance of air, and at the same time saturating this air with the particular drug or drugs dissolved in the oil.

The aveoli, it has been pointed out, may be reached indirectly by this method of treatment, as the drugs are absorbed by the lymphatics and enter the circulation to be again excreted by the mucous membrane. In this way the systemic as well as the local effect of the drug is exerted. In fact some over-enthusiastic supporter of the treatment suggests that, in all cases of irritable stomach requiring medicines for any cause, the intra-tracheal method of administration be employed!

The actual manipulation demands no special skill. The patient, light, fore-head mirror, etc., are arranged exactly as in making a laryngoscopic examination. The patient assists by drawing his tongue out with a towel or tongue-cloth held in the right hand, the operator now introduces the laryngoscope held in the left hand adjusts it in the patient's throat till the vocal cords are seen, while the right hand guides the nozzle of the syringe over the back of the tongue till the tip is seen, in the mirror, to pass over the epiglottis. Up to this point the patient has been breathing naturally; he is now directed to take in a short breath and hold it; then the fluid is ejected from the syringe slowly while the patient completes the inspiration, breathing gently but deeply.

Carried out in this way there is very little distress connected with the manipulation, hardly any more than attends the ordinary spraying of the throat, and after a few treatments, there is usually no discomfort whatever if the operation is at all skillfully done. Occasionally a patient is met with whose throat is so exquisitely sensitive that the slightest touch of the laryngoscope causes him to gag and cough or even vomit. In these cases a little cocaine sprayed against the posterior pharyngeal wall will permit the performance of the operation, or the laryngoscope may be dispensed with and the nozzle of the syringe carefully inserted back of the tongue without touching any part of the

sensitive mucous membrane. By directing the solution into the lower part of the pharynx a considerable quantity of it will be drawn into the larynx before its presence in the pharynx cause the patient to swallow.

As regards the solutions used pure olive oil has been found to be the most unirritating vehicle, and combinations of gnaiacol, menthol, camphor, ichthyol, chlorotone and the bromides in from two to five per cent. solution have rendered best service, and further experimentation will undoubtedly add other drugs and combinations. The solutions should be carefully prepared and none but the purest drugs employed. Just before using, it should be filtered and warmed to body temperature. For the first few treatments it will be found advisable to inject about one drachm, the dose being increased with the tolerance of the patient to three or four drachms or even more, at first daily, then at longer intervals as the case improves. During the treatment all cough syrups are dispensed with and internal medication confined to stomachics, tonics or eliminants as seen to be indicated in each case.

The cases which seem to yield most readily to this form of treatment are those forms of Bronchitis which have passed the acute stage, which have not gone on to complete resolution but are dragging on unrelieved or only partially relieved by internal medication (the so-called winter-cough); and particularly favorable are those cases which are characterized by profuse secretion. It seems as if the injections were capable of exercising a powerful action. I have seen patients who were coughing up from one to two pints of mucus in a day entirely relieved by two weeks treatment.

Teachers and others whose profession demands the more or less continuous use of the voice are bothered by an annoying tickling of the throat, due to a congestion of the tracheal mucosa (not the ordinary "preachers' " sore-throat) which keeps them coughing. The injections seem to exert a very favorable action in these cases. One young lady teacher who complained of this condition was entirely relieved by two treatments, and was not troubled again for a year. She made the remark at the time of the first injection that she could feel the medicine passing over the irritated spot.

Cases unaccompanied by mucus formation, which are probably of reflex origin, do not seem to receive more than the temporary amelioration which we would expect from the exhibition of local sedatives. It is these very cases which teach us not to be carried away by our enthusiasm for the intra-tracheal method, but to make a diligent search for the cause of every cough. We have all met cases which were due to impacted cerumen in the external auditory meatus, to foreign bodies in the tonsils, etc., etc., and to expect any lasting benefit from the injections in these cases would be unreasonable.

I treated one patient for a cough which was evidently due to reflex irritation. He had tried everything and had heard of this method and wanted to try it. He was treated almost daily for more than four months without any benefit. That was about two years ago. He is still coughing.

The injections have been used in the treatment of phthisis with comparatively gratifying results, that is to say, the cough became less frequent and much easier, the night sweats disappeared and the patients felt better, although, of course, the ultimate result was what would be expected.

Occasionally patients complain that the voice is somewhat husky after an injection. This is likely due to the oil which adheres to the edges of the vocal cords, and may be avoided if a mild alkaline solution be sprayed into the larynx after the injection.

In conclusion it may be stated that this form of treatment will not cure all cases of cough: many cases are disappointing; but in as much as it offers a means of applying medicines locally to the diseased respiratory mucous membrane, and so avoiding the derangement of the stomach which is often an unpleasant accompaniment of the exhibition of cough syrup, it is, I think, hardly presumptuous to claim that the intra-tracheal syringe forms a useful adjunct to our armamentarium in the treatment of diseases of the lower respiratory tract.

EDWARD C. WATSON.

AN UNUSUAL CASE OF INTUSSUSCEPTION.

MRS. W., æt 52, admitted to General Hospital Nov. 6th, 1905, complaining of severe abdominal pain and incessant vomiting.

Family history: One sister died of tuberculosis, otherwise negative.

Personal history: I am indebted to Dr. W. Kilborn, Sharbot Lake, Ont., for the following notes of the case previous to admission to the hospital:—"I first saw Mrs. W. in July, 1903. She was suffering intense pain in abdomen, most marked over the ascending and transverse colon. There was some vomiting. She recovered in about a week under hypodermics of morphia and atropine. She had three such attacks during the year 1904, besides several less severe, but all accompanied by diarrhoea and more or less tenesmus.

In May, and again in July 1905, she had similar severe attacks, differing little from previous ones, except longer in duration. I had never found any prolapse of the bowel until the day before I sent her to the hospital. She had then a great deal of tenesmus and told me something, several inches long, had protruded from the anus, which returned when she lay down. On asking her to bear down there appeared just within the sphincter a large soft globular mass, which I could easily surround with my finger. On elevation of legs and hips the mass passed out of reach."

On admission to the hospital, one week after the onset of her illness, she presented every evidence of general collapse. She had severe abdominal pains resembling "labor pains only higher up", and vomited at short intervals a dark green liquid. She said there had been no passage of either fœces or gas since the evening of Oct. 30th. Tympanitis was so marked as to prevent any attempt at locating the obstruction. The whole abdomen was tender, but especially so over the area of the ileo-cæcal valve. During these attacks of severe paroxysmal pain the maximum pain was always referred to the *right* iliac region, and at these times a confused peristaltic action of the bowels could be made out on palpation. There was, too, loud borborigmi. During each of these paroxysms there was a

passage of a large quantity of mucus. Only once during her entire illness, Nov. 21st, '05, was it blood-stained. The bowel was not protruding nor could it be felt per rectum.

Examination of the urine showed a few hyaline and granular casts, otherwise normal.

Her condition was now desperate. She objected to operation of any kind, and indeed in her weakened state, surgical interference seemed to offer little hope. Rectal injections of normal saline solution at 105 F. were tried, but without effect. A belladonna poultice (belladonna and glycerine) 20 x 20, was then applied over the abdomen, and the patient given stimulants hypodermically. In twenty-four hours there was a free evacuation of the bowels, with expulsion of a large quantity of gas. The vomiting ceased entirely and pain was much lessened. She was now able to retain albumen water, milk, &c., and in a few days showed signs of general improvement. After movement of the bowels an ill-defined tumor could be made out in the region of the descending colon, extending from Poupart's to the splenic flexure.

Her general condition continued to improve until Nov. 21st, when, without apparent cause a severe diarrhoea, with bearing down pains, set in. In a few hours a mass of colon, &c., 8 inches in length, protruded from the anus. At the apex of the mass was the ileo-cæcal valve.

Dr. W. G. Anglin, my confrère on the surgical side, was asked to see the patient and decided against operation, feeling that the intussusception could not be reduced and the patient's strength would not admit of an extensive resection of the bowel.

A belladonna poultice was again applied, and again there was a free movement of the bowels, with partial relief of symptoms. For the first time a well-defined sausage-shaped tumor could now be made out, following closely the line and extent of the descending colon. As there was no apparent sloughing of the bowel the opinion was hazarded that probably a double intussusception had existed, and that this alone had been relieved, permitting of the movement of the bowels. From this time on the patient grew steadily weaker, and on Dec. 20th faecal vomiting and abdominal tenderness again appeared.

She died Dec. 24th.

I am indebted to Dr. Hogan, house physician, and to two of my clinical clerks, Messrs. McDonald and Cliff, for most of the notes of the case after admission to the hospital, and to Prof. W. T. Connell for the appended P.M. report.

Examination of body of Mrs. W.—dead 12 hours—age 52. Quite well nourished woman, icteroid tint on skin. Rigor mortis and settling well marked. Body not completely cold.

Abdomen only examined—On opening abdomen, the omentum was drawn up and the visible portion of bowel showed more or less fibrinous matting with streaks of pus between coils. The intestine largely occupied the left half of abdomen, the cæcum and ascending colon being absent from their usual position and only a small portion of small bowel being visible. From the splenic flexure of colon to the anus was a large doughy mass, occupying the lumen of the bowel. At the upper end of sigmoid flexure a coil of jejunum had become firmly adherent and had perforated into colon and also externally (evidently at a much large date) into the peritoneal sac. This was the origin of the purulent peritonitis present. The point of perforation in jejunum was four feet from pyloric end of stomach. The small intestine, at a point eight feet from pyloric end of stomach, entered the colon at the splenic flexure as an intussusception. On opening up the intussusception it was found that the small bowel had passed into the colon as low as anus and then turning back to opposite the splenic flexure (primary receding tube) has again become intussuscepted as low down as upper end of sigmoid flexure opposite the perforation, where was situated the ileo-cæcal valve, the receding tube here consisting of colon. Thus from the splenic flexure to upper part of sigmoid there would be five tubes from the central lumen outward, viz. : Entering and receding tubes of ileum, entering tubes of ileum, ascending and transverse colon and the un-sheathing tube of descending colon and sigmoid. Neither intussusception could be reduced though it was possible to partially invert the iliac portion. There was a small collection of fæces at the point of entrance of the intussusception but it was evident that most of the bowel contents had passed directly into sigmoid through the jejunal perforation. It is impossible

to determine with certainty which was the primary intussusception. The intussuscepted portions were dark purple in color, their mucosa covered with mucus but nowhere gangrenous. Evidently the condition has been slow in development and had existed for a considerable period. The other abdominal organs showed no lesions.

JAS. THIRD.

A CASE OF ECLAMPSIA.

ON August 18th, 1905, I was called to Mrs. P. G., primipara, age seventeen, with a history of having reached full term.

On my arrival the woman was lying across the bed in a state of complete unconsciousness, the eyes being rolled upwards and face somewhat cyanosed. While I was taking the pulse she began to twitch rapidly, throwing the head backward, rolling the eyes, frothing at the mouth, biting the tongue and becoming markedly cyanosed. Her midwife stated that this was the second convulsion she had had within an hour. The convulsions were of the epileptic type and each lasted possibly more than a minute, then she lay as before in a semi-comatose condition.

Immediately all tight clothing was removed and as soon as possible a digital made. The os, not soft nor patulous, would however admit the index finger. The presentation was occiput but not yet engaged. Membranes not ruptured.

A large hypodermic of morphia was administered, the patient catheterized, and an enema given followed by a dose of chloral per rectum. The patient was then surrounded with bottles filled with hot water and cold cloths applied to the head. Despite this the convulsions continued at shorter intervals and each convulsion was of longer duration.

Dilatation of the os was begun, which as mentioned, was

rather inelastic. The os could be brought down and the fingers of both hands used as dilators. The process being slow the os was nicked in several places with a blunt pointed bistuary. Then the right hand was passed into the vagina the fingers forming a cone, and thus the os was gradually dilated until the whole hand was and finally the shut fist could be passed into the uterus. Deciding to deliver by forceps I ruptured the membranes, and after some difficulty the forceps were applied, but after considerable traction slipped. The forceps were again applied and although extreme traction was exerted, not much progress, if any, was made. Finally life being threatened, I perforated the cranium posterior to the apex with a pair of long scissors and cut forward a short distance. The cranium was felt to collapse somewhat under pressure of the forceps, and after strong traction the child was delivered.

Without delay the right hand was made to enter the uterus, the left exerting pressure on the abdomen. The placenta was seized and torn away. Hemorrhage was not excessive and was readily controlled by the hot water douche which was in readiness. It might be mentioned that during dilatation and cutting of the os, hemorrhage was considerable. The time spent thus far was about two and a half hours.

The patient was then washed, a perineal pad applied and the bed linen changed. The lungs were œdematous the rales being heard from any part of the room. Indeed the patient was so low that hope of recovery was slight. The head was lowered, hypodermics of strychnine and whiskey were freely given, a brisk massage kept up to the extremities and face. The patient was surrounded by hot water bottles and well covered; the bottles being refilled from time to time thus forming a primitive incubator. The circulation, pulmonary especially, soon improved and in about two hours she became conscious for the first time. The convulsions did not recur and I had no further trouble with the case.

A rather unexpected but pleasant feature about this case is, that the infant is living, takes nourishment and performs all its functions. A large scab of coagulated blood formed over and about the area of the head which was the scene of puncture.

Chloroform was not used.

A. J. LALONDE.

THE LIFE OF ANTITOXIN.

A CONSIDERABLE number of articles are now making their appearance in the medical journals dealing with the life or period of activity of antitoxic serums. As is well known commercial houses who manufacture serum in this country place or have placed a time limit of one year on their serums beyond which they will exchange for fresh issues, and this fact has naturally led to the belief that the antitoxin loses its peculiar virtues at or shortly after this period. Practically all who have investigated this subject find that this idea is not well founded. Any lowering of antitoxic value is apt to occur quite early, in fact during the first three months after the serum is secured from the animal, and if the serum is then *properly* kept in a cool dark place that it deteriorates very little or not at all during the next two or more years, and very seldom falls below the indicated value on the label. In evidence of this are the experiments recently published by Prof. E. Marx (1), by Miller (2), and by Layson (3). The serums made by most European houses, including that of the Pasteur Institute, are not exchangeable serum, as these houses evidently believe in the keeping qualities of their serums or else must risk the chance of their not being satisfactory and hence not in demand. In view of these facts it seems reasonable that no physician should hesitate to use a serum that has been well kept, even though it may be over a year from the date of manufacture. A physician should for choice use fresh serum as less likely to be deteriorated, but on no account to postpone treatment simply because such is not at hand, if old serum be available.

1 Prof. E. Marx in Festschrift in honor of Koch's 60th birthday.

2 E. C. L. Miller—Centralblatt f. Bakt. u. Parasitenk. Bd XXXVIII. Heft 2—1905.

3 L. O. Layson—American Medicine, Vol. II for 1905, page 746.

JOHN L. KANE, M.D.

DR. KANE was a man of upright character. In his bright though short professional career we have a good example of the fruits of indomitable perseverance. His parents died when he was quite young. He was never robust. Much of his life was a struggle from foes within and adverse circumstances without. He received his preliminary education in the schools of Gananoque. For some years he taught successfully a public school in a neighbouring county. Later he entered the medical department of Queen's. His course throughout was characterized by honest work and careful attention to details. He sought the pearls and they are never found on the surface. After acting as intern for some time in a small hospital in Rochester he began the practice of his profession at Aultsville, Ont., and was soon recognized by his patients as a careful, trustworthy physician.

On December 8th he was thrown from his sleigh, sustaining internal injuries from which he died a few hours later. In his death the community lost a good physician and the profession of Eastern Ontario a valued confrère. He was 29 years of age and unmarried.

J. T.

NOTES.

"The Alkaloidal Clinic" with its January issue changes its name to the "American Journal of Clinical Medicine". The change in name has been accompanied by an increase in staff, which ought to add to the value of this journal.

"Therapeutic Notes", published by Parke, Davis & Co., always has many useful hints regarding the use and indications for various remedies, as well as a list of new drugs and preparations which have proven themselves meritorious. Some items will always be found to be of immediate value in practice.

Several copies of a new journal, "The Bloodless Phlebotomist", have recently appeared. This journal is largely devoted to the mode of employment and indications for use of Antiphlogistine in those excessive manifestations of the inflammatory process so common in our bodies. Copies may be secured by addressing 57 Laight Street, New York.

BRANCH LABORATORY, PROVINCIAL BOARD OF HEALTH.

A branch of the Provincial Laboratory having been established at Kingston, analysis of swabs from suspected diphtheria, blood from suspected typhoid and sputum from tuberculosis or pneumonia, etc., will be made for physicians or Boards of Health free of charge. Specimens and inquiries should be addressed to Dr. W. T. Connell, Pathological Laboratory, Queen's University, Kingston, Ont.

BOOK REVIEWS.

BIOGRAPHIC CLINICS, VOL. III. By G. M. Gould, M.D. (Philadelphia, P. Blakiston's Son & Co.)

Almost all the chapters of this volume are reprints from various medical journals and the Popular Science Monthly. The two cases studied in chapters two and three are those of John Addington Symonds, and of Taine, and these appeared in the Maryland Medical Journal and American Medicine. Chapter four is by Simeon Snell on eyestrain as a cause of headache. Chapter five is by C. Ernest Pronger on slight errors of refraction and their influence on the nervous system. These seem to be published to prove that "in England the light is breaking." Dr. Gould, in the introduction to this volume, says "The continent of Europe still lingers in pitiful barbarism upon this subject. When my patients return from

these benighted countries they tell tales that should be gathered for the amusement of coming and humor-loving generations." Indeed Dr. Gould seems still of the opinion that little is known of refraction outside of Philadelphia. The chapter on the reception of medical discoveries, reprinted from the *Annals of Ophthalmology*, makes very interesting reading. It is mainly a defence of the extreme views of Dr. Gould. In it he makes the statement that "there are to-day several millions of people needlessly suffering the agonies of migraine", and the responsibility rests upon "learned editors, neurologists, oculists and leaders in medicine" who have not accepted without reserve all the statements of the writer. Dr. Gould has done good service in these studies, though there are not many who are willing to go all the way with him.

STARVATION TREATMENT OF CERTAIN MALIGNANT GROWTHS BY EXCISION OF THE EXTERNAL CAROTIDS. By Robert H. M. Dawbarn, M.D. The Samuel D. Gross Prize Essay. (Philadelphia : F. A. Davis Co.)

This is a record of original work done by Dr. Dawbarn with a historical résumé and histories, with commentaries, of cases treated by injection, by ligation and by excision of the external carotids. The histories are given of forty-eight cases of excision and of seventeen cases of excision and injection. The results attained are reasonably satisfactory and Dr. Dawbarn is encouraged to continue his work. The method of treatment by permanent anaemia will no doubt come to occupy a definite place in surgery.

MANUAL OF DISEASES OF THE NOSE AND THROAT. By C. G. Coakley, A.M., M.D. Third Edition, Revised and Enlarged. 118 Engravings and five colored Plates. (Philadelphia : Lea Brothers & Co.)

The value of this book is evident from the fact that a third edition has so soon been called for. Many changes have been made in this edition. The chapter on the Accessory Sinuses has been rewritten. A chapter on Therapeutics has been added and there are many new engravings and plates. The index has been much improved. Exception may be taken to some of the authors teaching which is at variance with conservative opinion and practice, but as a whole the book may be recommended to both students and practitioners.

CLEFT PALATE AND HARE LIP. A monograph by W. Arbuthnot Lane, M.S.F.R.C.S., Surgeon to Guy's Hospital, London, Eng.

This is a recently published monograph by this distinguished surgeon. It is issued in quarto form, and printed in very large and legible type which it is a pleasure to read. The illustrations also are numerous and well executed.

The subject of Cleft Palate is chiefly dealt with, and the author puts in a strong plea for early operation before the eruption of primary teeth. This is contrary to the generally accepted views regarding the treatment of these congenital deformities. No less an authority than Mr. Treves states in his "System of Surgery" that "whilst it is never wise to operate on a child under three years of age, the time of election is from this age up to six years."

After a careful perusal of Mr. Lane's monograph we are inclined to agree with him when he says "The best time to operate is the day after birth, or as soon after that as possible. The newly born child is always healthy, the capacity of its tissues to repair being at the very best; its digestion has not been impaired by experimental and usually most unsatisfactory feeding, and its resisting power reduced correspondingly; it is apparently uninfluenced by the operation in that it does not cry or show evidences of being in pain; it is never sick after the anæsthetic, but takes its food within an hour or two of the completion of the operation with apparent enjoyment; the loss of blood is very slight, and the risk to life is under ordinary conditions very trivial indeed."

Other arguments in favour of early operation are these: the abnormality is an arrest in development, and therefore the sooner the parts are placed in their natural positions the more likely is development to proceed along normal lines, and if the palate is reconstructed before the child attempts to talk the voice will not acquire the quality which is spoken of as "nasal".

In these operations the individual skill of the surgeon is a very prominent factor, and Mr. Lane's method of operating is very clearly set forth in numerous illustrations of the formation of flaps and the special instruments employed.

W. G. A.