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PRESIDENT'S ANNUAL ADDRESS.—AMERICAN PUBLIC HEALTH ASSOCIATION.

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Mr. Chairman, Members of the American Public Health Association, Ladies and Gentlemen,—It becomes my pleasing privilege, as your duly elected President for the year 1900, to express to you my deep sense of the honor conferred upon my country and myself, as her representative, through your generous act. To have been called upon to preside over the deliberations of a congress which is engaged in studying questions of vital interest to three nations and to ninety millions of people has, indeed, served to impress me not more with the magnitude of the work we are engaged in than with the limitations of my powers to adequately fulfil the duties and responsibilities which the position involves. Allow me, therefore, ladies and gentlemen, to bespeak for myself your generous indulgence and kindly sympathy while performing the duties of your presiding officer, and for my excuse in those matters wherein I may fail. I must take refuge under that time-honored excuse expressed in the words of the old Latin poet:

Si possem, sanior essem,
Sed trahit invitam nova vis ; aliudque cupido
Mens aliud suadet : video meliora proboque
Deteriora sequor.

—OVID (M.), 7-18.

With the passing of more than a quarter of a century since the first annual meeting of this association many of its earlier members have ceased from their labors ; but it becomes my official duty to record the untimely deaths of several members who have passed away while still in the prime of life. I recall the names of

Edward Oram Shakespeare, M.D., Philadelphia, Penn ; George Edam Coulthard, M.D., Fredericton, N.B., and Henry Cooper Crouch, M.D., Denver, Col.

To mention the name of Dr. Shakespeare is but to present to mental vision the author of that classical work on cholera, which has supplied us with so comprehensive an outline of the conditions which have governed in the past, and still are largely present in outbreaks of this scourge of former times. I can well recall Dr. Shakespeare, as he labored at quarantine on the Delaware, associated with state and municipal officers, in 1892, to protect his city and country against the threatened invasion of this disease. Since then his kind and genial presence was with us at our meeting, in Philadelphia, in 1897. His demise has seemed sudden to many who knew nothing of his illness, till his death was chronicled on June 1st.

Of Dr. Coulthard, the Secretary of the Provincial Board of Health, New Brunswick, it may be said that all who have known him during the past five years, during which he has regularly attended the meetings of the association, will retain a recollection of him as a gentlemanly but retiring man, but who proved on acquaintance a genial friend and an enthusiastic officer of health. His work was well known and appreciated in his own province, while his activities as a physician and citizen in Fredericton were spoken of most favorably by the local press. In him the public health service in Canada loses an active and conscientious worker, and this association a loyal member.

Of others who have passed away the association has had less opportunity of learning their worth. The positions, however, which they have held in their own state and city have marked them as active workers in the field of public medicine, and they have passed *magna cum laude* to their rest with the honored dead.

But while I recall the memory of our dead I take this opportunity of expressing, as their official mouthpiece, the sense of pleasure at which the members of this association may fairly indulge in, as they find themselves greeted by the living representatives of this beautiful city, in a state in what is rapidly becoming to us the older West. I am not exactly informed as to just at what age an American state attains its majority ; but I take it that any state that has presented a president to the nation—and such a president as Benjamin Harrison—must be looked upon as having arrived at years of full maturity. The association trusts, however, that even a mature state may still find something of value to be obtained from having its sessions held in its capital city, and in return its members hope to bear away with them memories, not only of kindly welcome and generous entertainment, but also of evidences of the application of science to public health problems in a manner often more easily carried out than

where the traditions of the hoary past still linger. The association feels sure, however, that in a state whose earliest boundaries indeed were embraced in those two wondrously euphonious words: Ohio, the Beautiful, and Onabache, the White, that its members will experience from her citizens every kindness which can spring from those who live constantly under the beneficent tutelage of the good deities of two such beautiful streams.

It has become the established custom of past years to summarize, in the presidential address, some of the more important phases of public health work, which have attracted scientific attention during the year preceding each annual meeting. The past year, like those which have preceded it, has also presented matters of interest which might, with profit, be referred to; but as such will naturally engage our attention in the several papers to be presented at subsequent sessions, I have deemed it not inappropriate to attempt a survey of public sanitation as embraced in the history of social and scientific progress during the century just closing, and can only hope that from such we may obtain some idea, however inadequate of the truth, beautifully expressed by Emerson in his essay on history, that "There is a relation between the hours of our life and the centuries of time. As the air we breathe is drawn from the great repositories of nature, as the light on my book is yielded by a star a hundred millions of miles distant, as the poise of my body depends on the equilibrium of centrifugal and centripetal forces, so the hours shall be instructed by the ages and the ages explained by the hours."

In order, then, to obtain any adequate conception of the causes which have brought "public health" as a science to the position we find it occupying at the close of the century, we have to inquire into the influences which have been at work during the hours of the century, and of that period just preceding it, the "Renaissance" which may be justly called the birthday of modern science, and of which Carlyle said, "Behold, a new era is come! —the future all the brighter that the past was base."

Of it, as epitomized in the French Revolution, we may truly say that though its advent was marked by portents, agonies and birth throes, yet there it stood, an indubitable fact, with infinite potentialities, and having stamped upon its, as yet infantile, features, the ineradicable birth-mark: "The rights of man." For fifty years had France, England, Germany and America been sensible of the pulsations of a new being—Philosophy and Science had conceived it and been its sponsors at the christening. Not, however, that in germinal force it had not existed earlier, for had not Copernicus, Kepler, Galileo and Newton already lived and offered to the world divine gifts? But till now, as of the words of the great moral teacher of an earlier age, "The ears of men were deaf that they might not hear;" or, as expressed by Carlyle,

"Of a truth the long demonstrated will now be done, the age of revolutions now approaches, but then of happy, blessed ones. Man awakens from his long somnambulism, chases the phantoms that beleaguered and bewitched him."

To none more than to the sanitarian is it evident that the ethical element, or "elevation in the scale of being," must ever be the measure of social progress; and hence it is that sanitary reform is intimately associated with the history of religious, political and social development, for our motto, "*Sana mens in corpore sano*," is but a terse expression of the fact that the science of public health relates to man in every phase of his being. Hence it becomes necessary that we review the social status of the people amongst whom our science took its birth, in order that we may comprehend what progress has been made.

To mathematics, whose development first gave to that oldest study, astrology, a form and meaning, stripping it of its mysteries, and enabling men to establish the first truth of science, viz., the unalterable character of the laws which govern the universe and guide the planets in their course, are we to look for the first evidences of that intellectual development which marked the Renaissance. As a part of it began, those experiments in physics or natural philosophy which especially marked the genius of Galileo, and gave us some of the first crude scientific instruments, making deeper physical investigations possible. Slowly, indeed, were the swaddling bands of astrology and divination cast off, and the reign of natural law inaugurated. But Bacon, with his marvellous powers, had instituted the inductive method, and pressed forward the idea of a scientific society which might give prestige to the work of original experiment, which resulted in the Royal Society of England being founded in 1649. By it first were published those discoveries of Newton which made the extension of his marvellous investigations possible to students on the continent. Their supreme importance may be judged from the fact that in France we find that the greatest scholars among the encyclopedists were all mathematicians, and that D'Alembert, Lagrange, Helvetius and others won their membership in the Academy of Sciences by theses on some subject of natural science. But with the foundation built on which the superstructure of science became possible, we find the spirit of investigation spreading into every field, and though editor Diderot saw volume after volume of his encyclopedia seized under royal interdict, yet after years he saw them published even with royal sanction, since in them the king found described the method of making gunpowder, and the royal mistress the method of making rouge and manufacturing silks. So it came to pass that this marvellous work of twenty-one volumes became a potent agency in developing the spirit of the New Age over both Europe and America. To it

D'Alembert, Helvetius, Turgot, Buffon, Condorcet, Marmontel, Rousseau and St. Lambert were all contributors, while towering above them was "Patriarch" Voltaire, as he was affectionately called, and of whom, as philosopher, litterateur, poet and politician, Carlyle has said: "So far as present knowledge enables us to judge, it may be said that to abstract Voltaire and his activity from the eighteenth century, were to produce a greater difference in the existing figure of things (1829) than the want of any other up to this day." Indeed, the then thirst for knowledge may be said to have become a universal passion, and it is stated that at this time the sale of books in Paris was four times as great as in London. Remembering, as Lecky writes, that, "in France absolute monarchy had destroyed all liberty and all opposition, and having prevented a school of practical reformers, politics came to be treated like a problem in geometry or ethics, to be worked out on general principles with a complete disregard to the traditions and the special circumstances of the nation," it is little wonder that Rousseau's "Contrat Social" came to be looked upon as a new gospel, and for the influence it exerted we must class it with Adam Smith's "Wealth of Nations." How could it be otherwise when it set forth what were then new ideas, but to us now mere axioms?—That (a) society originally was formed for the protection of the lives and property of those composing it; (b) that to live in peace and security was the right of individuals; (c) to this end certain organizations and laws were necessary; (d) that as to do this costs money equalized taxation was necessary and majorities should rule. The outcome of such teachings to a people to whom science was revealing the marvellous secrets of nature and teaching a uniformity of laws, and the dominance of intellect is obvious. Of that ever memorable 4th May, 1789, when Versailles saw the Convocation of the States-General, which had not met since 1614, in a country where existed "no Habeas Corpus Act, no liberty of the press, no legalized religious liberty, no trial by jury, and no national representation," Carlyle says: "It is the baptism day of Democracy—sick Time has given it birth, the numbered months being run—the "extreme unction" day of Feudalism; a superannuated society, decrepit with toils is now to die; and so, with death-throes and birth-throes, a new one is to be born." Amidst all the horrors of that revolution, which advanced with lightning rapidity, there is to be observed the influences that preceded the Renaissance, regarding which Talleyrand remarked: "He who did not live before 1789 has never known the charm of life." As expressed by Lecky: "The study of physiology, botany, comparative anatomy, and electricity advanced with gigantic strides; and in the enthusiasm which prevailed it was imagined that physical science would soon unlock the secret of the universe and disclose the mystery of life."

Lavoisier laid the basis of the science of chemistry, and Fourcroy, by popular lectures, made its study fashionable. Petit taught anatomy, Nollet electricity, and Arago astronomy; while Laplace, in his "Celeste Mechanique," gave to the world his nebular hypothesis, which at the end of this century still stands for us as a working theory of the evolution of the universe. And even though Mongolfier excited the wonder of the people by his balloons, and Mesmer cloaked a scientific fact with charlatanism, while Count Alessandro di Cagliostro, "by profession a healer of diseases, abolisher of wrinkles, friend of the poor and impotent, grandmaster of the Egyptian Lodge of High Science, spirit-summoner, gold-cook, Grand Cophta, prophet, priest and theurgic moralist and swindler, exploited the ladies of three courts, only to come to grief at last over the theft of the diamond necklace, yet there is the imminent fact that in the councils of this period of maelstrom ferment, when so many noble men were sucked into the vortex, there was a galaxy of earnest spirits filled with a love of truth, greater probably than was ever before gathered in the parliament of any nation. It was as the Golden Age of Greece in art, or the glories in literature of the Elizabethan period—Turgot, writer on economics, was Minister of Finance; Helvetius, the mathematician, was Director of Forests and Farms, and developed scientific agriculture. Laplace was a Secretary of State, under the National Convention, while Lavoisier, whom the German Wurtz has called the "father of French chemistry" was, in the words of Lalonde, "to be found everywhere,"—and with what good reason amongst a people where the search after scientific truth was at fever heat in every department of life. It was as when the prisoner comes from the close dungeon into the free air of heaven—he breathes deeply and again for fear he may lose it. The situation is epitomized in the life of Lavoisier, a model of what the man of science may and ought to be. Born in 1743, of wealthy tradespeople, he had all the early advantages of the schools of his time, and studied mathematics, astronomy and botany assiduously, and became so absorbed in natural philosophy that at twenty-three years of age he gained the gold medal of the Academy of Sciences for a thesis on "Lighting of the Streets of Paris." He analyzed gypsum and is soon found touring France with Guellard, and making a geological map, subsequently publishing "Memoires surcouches des Montagnes." At twenty-six years of age he was made one of the Farmers-General, in order that his resources for advancing scientific study might be increased. Imagine such a possibility to-day! He soon overtook the pneumatic studies of Black, Cavendish and Priestley, checked their errors and added to and gave form to their studies on air. Weekly experimental laboratory reviews of work done were carried on by him with Laplace, Mayer, Berthollet and

Fourcroy. In 1778 he gave to Priestley's dephlogisticated air the name of oxygen, meaning thereby the acidifying principle; in 1781 synthesized carbonic acid; in 1784 analyzed water, thereby making first advance toward the analysis of organic substances, and in 1787 published "Methode de Nomenclature Chimique," a system of nomenclature which lasted for fifty years, and is the basis of that still in use. In social reform, as a Farmer-General, he succeeded in having many oppressive taxes of the people removed, even from the Jews of Metz. In 1776 he was made director of powder-works by Turgot, soon quadrupled the output, and improved by one-third its explosive power. It was Lavoisier who made the chemical balance the ultimate ratio, and hence established the basis of quantitative analysis. He analyzed soils and manures, and even doubled the product of his own farm. In 1787 he was the philosophical statesman of the Provincial Assembly of Orleanais. In 1789 he reported to the National Assembly on "Caisse d'Escompte," and in 1790 sat on "The Commission of Weights and Measures"; while in 1791 as Commissioner of the Treasury he established a system of accounts hitherto unequalled, and soon was asked to write a treatise on taxation and wrote "De la Richesse Territoriale de la France." And now the political eclipse: on the 2nd May, 1794, Dupin, in the National Convention, brought some frivolous charge against Lavoisier, and six days afterwards he, with twenty-seven others, went to the guillotine, the brutal reply to a petition for a reprieve being: "The republic has no need for savants." Well, were it for progress if the words of Lagrange, regarding Lavoisier, were writ large everywhere in these days of political bouleversements: "*Il ne leur a failu qu'un moment pour faire tomber cette tête, et cent années peut-être ne souffrent pas pour en reproduire une semblable.*"

But enough has been said to fully illustrate those widespread intellectual and scientific movements which, springing up so largely in France, spread even to the imperial courts of Germany and Italy, and of the autocratic throne of the Czars, and which laid the basis of the marvellous progress in practical science of the nineteenth century. Nor must it be supposed that these influences were extended only to the progress of the pure sciences. Foundling and Magdalen Hospitals were founded; Abbe de l'Épée invented an alphabet for the blind, and Houay founded an institution for the deaf and dumb, and asylums for insane were opened, while Frederick the Great made education almost compulsory in Prussia.

To England must we now look and briefly examine a current of influence, arising from allied but different causes, and productive of a social progress based, perhaps, upon a less exact intellectual and scientific foundation, and more upon what may be called the practical social needs of a people. The deep-laid religious

convictions of their ancestors who, in a previous century, had struggled for religious and political freedom at a time when France was under an absolute despotism, and which culminated in the civil war and the Commonwealth under Cromwell, and the subsequent Revolution of 1688, with the establishment of a new dynasty on the throne, had never been lost or seriously dissipated, especially among the agricultural and industrial classes, whether of England or her great colonies in America. It is true that the parties of the early part of the eighteenth century exhibited every shade of political corruption; but the idea of the liberty of the subject and of the constitutional limitations of the crown, growing out of the Witanagemot of the old Saxons was never lost, while the growth of colonies and of sea-going commerce kept alive a spirit of enterprise and independence of thought, which received added strength from the marvellous industrial progress of the latter half of the eighteenth century, due to the mechanical inventions which gave England that financial prominence that has marked her course through the nineteenth century. The French intellectualism of the Renaissance found a congenial soil for its growth among the descendants of the Pilgrim Fathers and Virginian descendants of those emigrants, who for two centuries had breathed the free air of a new world, while the outcome of the War of Independence gave to a decadent Toryism in England its *coup-de-grace*.

Such were the influences which enabled the younger Pitt, at twenty-five years of age, Premier of England, surrounded by men of unusually intellectual strength, to carry England safely through the trying years of the French Revolution and the Napoleonic wars, while the world was taught very many lessons of what a people once in thralldom may become and do when, imbued by the broad truths of the "Contrat Social" and the "Rights of Man," they strike for individual and national freedom. England had, with the growth of the colonies and the founding of the new empire in India, been developing her commerce during the reign of the first Georges; but this progress became rapidly accelerated from 1750 onward, owing to several remarkable mechanical inventions in manufacturing machinery. Of these the inventions for the manufacture of cotton goods were the greatest in their immediate results. The stories have often been told of how Hargreaves invented the spinning-jenny, and how Arkwright increased many times over, by the use of rollers, the amount of yarn made; and of how Cartwright made the power loom and cylinder presses for printing cotton goods, have all been told again and again, while the improvements of Watt, once a Scotch watch-maker, in the steam engine, making it almost the very machine we see to-day, enabled Arkwright to run his machines by steam, and engineer Rennie set the wheels of the great flour mills of London revolving by the same agency. If to these we add the improvements made

in the manufacture of iron and the extension of the use of coal, and the construction in a few years of miles of canals, making cheap transportation possible, we may understand some of the principal influences, which gave a pre-eminence to England in commerce, while entirely altering both her internal economic conditions and her foreign policy. Manchester, Liverpool and Glasgow sprang from small towns into cities, and agricultural England, by the end of the century, had become a country of large urban populations, with mercantile fleets upon every ocean. Indian nabobs returned home to spend their millions of rupees, and with the rise of wages was begotten higher modes of living, associated with a sense of educational needs, all stimulated by the intellectual Renaissance on the Continent. What this industrial expansion means may be gathered from the fact that within the forty years up to 1840, the number of those engaged in the cotton manufacture in England had risen from 80,000 to 833,000, while the population of Lancashire alone during the eighteenth century rose from 166,200 to 672,000. To-day it is over 4,000,000.

To these causes, so briefly summarized, are we to look for the beginnings of what we now call State medicine, of which England has during the nineteenth century been the most fruitful field. Up to the end of the century the sudden expansion of her foreign trade owing to these discoveries, and the high prices consequent upon the Napoleonic wars, created such high rates of wages, and so great general prosperity, that the sanitary evils which were rapidly growing up with the development of the factory system were as yet hardly noticed. But the escape from a national calamity, such as had overtaken France in the Revolution had accelerated what is called the "evangelical movements," so large a factor in educating the national conscience in England to a sense of the truth of the Scripture that "a man is his brother's keeper." Associated with the younger Pitt, the model of the domestic statesman, as a personal friend, was William Wilberforce, whose broad Christianity and practical common-sense served to make him the first social reformer whose energies as a legislator were definitely devoted to the amelioration of the condition of his fellowmen, while supported outside by the "Society for the Abolition of the Slave Trade," amongst whom the Quakers were the most active; public meetings were held and statistics were carefully collected to show the inevitable horrors of the traffic. Wilberforce presented, in 1788, no less than thirteen petitions to Parliament praying for its abolition, and the first steps were taken in that year to mitigate the horrors of the ocean passage; but the opposition was great and the fight prolonged. But that strong practical conscience of England, which time and again has forced Parliament to act, as in the Reform Bill of 1831, and the repeal of the Corn Laws in 1846, had been aroused; and the people proved their sincerity by

multitudes refusing to use sugar, as being a product of slave labor. This education of the public conscience by public meetings was now for the first time becoming a normal instrument of politics, and of such influence under popular government we, in our day, are fully convinced.

This anti-slavery crusade was but another phase of a work which may be looked upon almost as the first attempt at sanitary reform, viz., the investigation of the prisons of England and the Continent by John Howard. First captured at sea in 1756 by a privateer and sent to a French prison, he had personal experience of the abuses which existed; and in 1753, as High Sheriff of Bedfordshire, he had ample opportunities of studying the prisoners under his charge. Till his death, in 1790, prison reform became his life-work, and to Britain and the countries of Europe he revealed a mass of maladministration and atrocious treatment, which made the most indifferent assume an interest. Insufficient food and starvation only prevented by private charity, no sewers, no infirmaries, and no means of warming prisoners, and almost no water was, as a rule, to be found; while prisoners were crowded "in dark subterranean dungeons, reeking with pestilential effluvia." In most prisons there was no allowance for bedding or straw to lie on, and even if obtained was not changed for months. There was almost no ventilation, owing to the window tax; and so vile was the air "that Howard declared that after visiting the prisons his clothes were so impregnated that he could not bear to drive in a post-chaise with closed windows." Naturally, in such a place human life rapidly withered, and scurvy was deadly, while typhus, called gaol fever, raged with such virulence that more prisoners died from it than from the gallows; while if discharged they became sources of contagion wherever they went. Many gaols were private property, and here, as in too many public ones, evils of even a grosser kind prevailed, for chains, iron collars and even iron bars, removed by brutal gaolers only for bribes, were in use, while lunatics were often added, making pandemonium of Tartarus. Old and young, male and female were indiscriminately huddled together, and prisons for punishment became schools of vice. Such conditions seem to have been worse in England than in some other countries, as Holland and Switzerland, where Howard was told that gaol fever did not exist. Though Pitt recognized the evils and need of reform, as pointed out by Howard, but little was accomplished till the time of the great reforms in the third decade of the nineteenth century. Reference has been made to the great and rapid development of factories, and the aggregation in towns of a population once largely rural. One of the greatest evils resulting from this was the employment of cheap child labor, so many men being drafted away to the continental wars. Indeed, so completely did the great Pitt misconceive the situation, that in

speaking about the laboring classes he pointed out how much was got from the industry of children and the advantage of employing them at an early age. Indeed, many were sent out at ages of from six to ten years, from workhouses and contracted for, commonly working in factories from twelve to even sixteen hours daily, as was proved by parliamentary inquiry. Curiously, as a result of this industrial development, there took place the immense increase of negro slavery in America which, as pointed out by John W. Daniel, of Virginia, in his famous oration on Jefferson Davis, had been protested against in 1727 by South Carolina, and prohibited by law in Georgia, in 1760, while Virginia taxed every owner \$10 per slave. Indeed, as remarked by Lecky, it seemed, at the time of Washington, "likely to be extinguished by an easy and natural process." How slow, in the face of the growing influence of the great centres of manufacture in England was the growth of factory acts and public health legislation, we shall see as we trace the progress of the nineteenth century.

As regards the evolution and progress of public health during the present century there would seem to be four periods more or less distinctly marking its growth and that of those sciences which form component parts of it. These are: (1) the period of investigation, extending to about 1830; (2) the period of agitation, extending to 1850; (3) the period of legislation to 1875; (4) the period of elaboration and development. We shall refer briefly to each of these.

1. *The Period of Investigation.*—The opening year of the century is notable because of the establishment in London of the Royal Institution, originally conceived as an establishment for the benefit of the poor. This institution has a special claim upon the interest of this association, since its foundation was due to the efforts of Benjamin Thompson, a Royalist American, who, going to Europe after the Revolution, had engaged in various services in different countries. His labors were in the field of philanthropy, where he specially endeavored to have science applied to domestic economy, and especially for having cheap foods supplied for the needs of the poor in London and other large cities. It was intended to institute a system of popular lectures in order that a practical knowledge of inventions, and of the means of obtaining the comforts and conveniences of life might be rapidly diffused. Humphrey Davy, then a budding natural philosopher, was fortunately appointed first lecturer on chemistry, and succeeded in a remarkable way in interesting the public in his discoveries, and in popularizing science in England. A lecturer of marvellous power, he traced out in the introductory lecture of 1802 the resources of science for humanity, and dwelt upon its dignity and nobility as a pursuit, and upon its value as a moral and educational force. The lecture created a sensation, Davy

became the lion of fashionable society, and for thirteen continuous seasons gave lectures on many and most varied subjects, from "laughing gas" to the constituents of artificial manures for agricultural purposes. But most to be remembered is that invention—the miner's safety lamp—the result of a few months' experiment which he had undertaken at the request of those specially interested in coal-mining. Seldom if ever has the sanitary value of a single invention been so quickly appreciated, and its benefits so strikingly illustrated; and yet when asked to patent the discovery, Davy wrote: "I never thought of such a thing, my sole object was to serve the cause of humanity." In addition to the number of splendid workers whom Lavoisier left behind him in Paris, as Laplace, Fourcroy, Guyton de Morveau, Gay-Lussac, Berthollet and Humboldt, England possessed other investigators, who, if not popularizing science, were perhaps adding, even more than Davy, to what has proved of extended permanent value. Of these, was the scholarly physician and conscientious investigator, Dr. Wollaston, who, regardless of money, devoted himself, in 1801, to pure chemistry, and was among the first to begin its application to physiology. He made platinum invaluable and gave us the theory of chemical equivalents, dipped into electricity, and came to be regarded as the greatest master of pure chemistry of his time. He died in 1828. Alongside his work must be placed that of the Quaker schoolmaster, Robert Dalton, since his work was especially in that branch which we now call chemical physics. His chief work was done in that centre of industry, Manchester. He has been called the father of modern meteorology, and did more to establish the laws of gases or elastic liquids than any who had preceded him. He it was who first pointed out that aqueous vapor was mechanically combined in the atmosphere, and that each gas therein is subject wholly to its own laws. His experiments on dew and moisture were wholly new, and he gave us the earliest definition of the "Dew Point." He pointed out that fluids could conduct heat as well as convey it by convection, and demonstrated the important fact of heat being produced by mechanical pressure of air, and cold by its rarefaction. He likewise demonstrated that springs owed their origin directly to rain falling on the surface. He established the law of the expansion of gases, and constructed the hydrometer, and proved that the amount of evaporation in any given time was strictly proportionate to the force or pressure of aqueous vapor at the same temperature. His work in this field of pneumatic chemistry first led him to theorize as to the constitution of matter, and to him we owe the first clear conception of the "Atomic Theory" as we find it to-day, but little modified; and taking hydrogen as unity he determined the weights of many elements and the law of multiple proportions through the constitution of the elements in compound bodies. Questioned and doubted, his

discoveries were substantiated, and Davy asserted that the "Atomic Theory" was the greatest discovery of the age, and placed his services to chemistry on a par with those of Kepler to astronomy. His useful life was extended till 1844, and we find in him one of the Nestors of the British Association for the Advancement of Science. In Dr. Thomas Young we have the third of a triad of great men grouped together by the first president of the British Association as making glorious the history of this period of our century. He it was who first established the wave theory of light; he made deep researches in electricity, and was valued for his mechanical knowledge as well as for his knowledge as a physician. Equally celebrated in science, which knows no country, was Berzelius, of Sweden, and Gay-Lussac, Ampere, Volta and Oersted and Arago in France, and Ohm, Seebeck and Becquerel in Germany, whose discoveries only awaited the wizard touch of the Canadian-American, Edison, to cast the rays of the search-light on a whole region whose mysteries had hitherto been concealed. Following the labors of Lavoisier and his associates in France, and of Werner in Germany, but at a later date, this period saw laid the foundations of geological science in England, when Mr. William Smith published his map of the strata of England and Wales. Dr. James Hutton and Dr. John Playfair had both preceded him in Scotland, and explaining the past by the present, had appealed to the action of streams and seas, and the processes of decay and reconstruction to account for the changes of which the earth's crust bore records. They boldly led the mind back to an illimitable past for an explanation of world-phenomena, and, like Galileo, once more dared the anger of those whose biblical cosmogony had so long obstructed the rational interpretation of the phenomena of nature. Into the ever-widening field of investigation came Lyell and Sedgewick, Buckland and Murchison, until, in 1830, appeared Lyell's "Principles of Geology," which became for thousands of students an open sesame to Nature's wonders. With students as Buffon and Cuvier in zoology, Louis and Dupuytren in medicine and anatomy in France, and Hunter and Jenner in England, it was evident that the *dissecta membra* of science must soon be brought together, when the phenomena of the external world could be utilized to interpret the laws of the physical system of man. At the beginning of the century the medical profession in England was represented by an array of surgeons, physicians and apothecaries, and an array of nondescripts, from tooth-drawers and cutters to barber surgeons, subject to no controlling body, and unrecognized by law. In 1815 the Apothecaries' Act was passed prohibiting practising without a license, but excepted the licentiates of the universities of Oxford and Cambridge, of the Royal College of Physicians, and of the Royal College of Surgeons, and henceforth gave "a

definiteness of direction to medicine in England, which had already made the schools of Paris, Vienna and Edinburgh famous, but which, as we learn from Dr. Oliver Wendell Holmes, was long indeed in extending its influence across the ocean to America. What England and her daughter lacked then was what Sir David Brewster, a president of the British Association, lamented as late as 1840, viz.: A national institute wherein men set apart and paid by the nation could devote themselves wholly to the study of science. As neatly expressed by Rev. Mr. Harcourt, the first president of the British Association, in 1831: "The mining field of discovery seems to me to show, on the one part, the ore breaking out on every side, and, on the other, a multitude of hands ready to work it; but no one engaging them to labor or showing them in what manner they may employ their industry to the best advantage." We have already seen how the century opened with a nation awakened into a new life of industry whether on farm or in factory. The drain of men to the Napoleonic wars, and the constant demand for workers for the arts and manufactures, had supplied abundant labor and high wages in England for all; but with 1815 came a sudden change in conditions which was first to create a series of conditions of unprecedented misery and discontent, succeeded by social agitations whose outcome none could see, but which were the precursors of that glorious period of reform of which the sanitary improvement of the people formed so important a part. The cotton trade had till 1815, with good prices, steadily developed; but now, fortunately, another great step forward became possible, which, by greatly extending its manufacture, gave employment which lessened the prevailing social misery. The power-loom, hitherto an imperfect success, and machinery for spinning was perfected far beyond the capacity for weaving the yarn into fabrics, while the supply of cotton had been enormously increased by the ingenious invention by Eli Whitney, an American, of the cotton gin. But the Jacquard loom so multiplied production that the looms multiplied from 3,000 in 1815 to 30,000 in 1825, and the output from 82,000,000 to 230,000,000 lbs. On the other hand some 250,000 hand-loom weavers were being displaced, and ruin and destitution followed. To the discontent caused in this way was to be added that of disbanded soldiers and a farming population, where prices had fallen from 74s. to 43s. per quarter for wheat in three years, while even bread, boots and salt were taxed. As a result, discontent, rioting, destruction of machinery and violence marked the years succeeding the war, while agitation for reform was spread through a growing free press. Luckily, in William Cobbett was found a reformer who was not a revolutionist, and the "Hampden Clubs" urged peaceful methods, and especially workingmen's clubs, and found support even amongst the upper and middle classes. The first step forward

was in 1823, when the protective navigation laws were repealed, and in 1826 even the corn laws were modified by the sliding scale, while the introduction of railway legislation in 1823, by which an immense demand for labor and capital was made, seemed further to lessen the miseries of a long commercial and agricultural depression. Already had Fulton steamed his vessel up the Hudson in 1807, and another crossed the Atlantic in 1819; while George Stevenson was giving a practical value to locomotives, of which one had worked on the roads of Paris as early as 1769, and in 1823 there was a charter given for the first railroad, forty miles long, built by Stevenson and operated by an engine essentially the same as that of to-day. With such era-making inventions, marking the progress of science and the diffusion of knowledge of the universe and the capacity of the human intellect to overcome difficulties, it was natural that society at large should become conscious not only of its needs, but also of the right and possibility of having them supplied. Hence, among the working classes, among whom wages still remained low, and the conditions under which they lived showed but little improvement, there grew a deep-set determination to assert and obtain their rights. Trades unions grew apace, and even a Conservative government gave partial legal rights to these organizations.

2. *The Period of Agitation.*—The agitation was, as always, for the recognition of popular rights. The year 1829 saw in England the Catholic Emancipation Bill passed, admitting Catholics to the rights of free citizenship, while a bill of parliamentary reform, the agitation for which had convulsed the kingdom from end to end, became law in 1832. In 1833 the results of the long agitation by philanthropists were crystallized in a bill for the abolition of the slave trade in the British colonies; in 1834 the growing evils of pauperism were checked by the enactment of a new Poor Law, while in 1835 the Municipal Corporations Act restored to the inhabitants of towns those rights of self-government of which they had been deprived since the fourteenth century. The year 1836 saw the passing of an act giving dissenters the right of civil marriage, and 1839 the appointment of a committee of the Privy Council on Education. But now the long results of all these movements toward social progress were to bear fruit in the applications of the newly-discovered facts of science to measures of sanitary reform. The echoes of the warnings of Sir John Pringle regarding the preventable evils under which the troops had suffered in Flanders, in 1742, and of the unnecessary mortality from gaol fever given, in 1750, had long since died away; and though it had been shown that scurvy had been prevented on the ship *Resolution*, which sailed round the world under Captain Cook, by the use of fruits, and even though Lavoisier had spent weeks in studying the pestilential air of the great sewers of Paris, yet the fatalistic

belief in disease as being a punishment of men for their sins was too deep-seated to enable the bearing of isolated scientific facts upon the preventability of disease to be in any great degree realized. But now the evils resulting from the congested populations of industrial centres were becoming so apparent, and the losses to commerce so positive, as to be no longer unnoticed by the growing altruism of a progressive nation. Child labor, often paid for at a penny a day, had become a monstrous and a crying evil; yet workmen were driven by poverty to send one after another of their children into factories, only in the end to beat down their own wages. Children of six and seven years of age often worked twelve hours a day in factories where the atmosphere, physical and moral, was abominable, and children of both sexes were growing up in a commercial slavery. Agitation in parliament caused a committee of inquiry to be appointed, and eminent physicians pointed out that the system meant a mental, moral and physical degradation of the mass of the English people. In the reform parliament of 1833 the good Lord Shaftesbury became the people's champion, and introduced a bill limiting child labor to nine years, while the manufacturer raised the cry that with such keen foreign competition English manufacturers must be ruined. Although the doctrine of *laissez faire* succeeded in making the ten-hour period applicable only to children of thirteen, yet trade was not ruined, but flourished remarkably in succeeding years. The government actuary had already made a statement before a parliamentary committee that though the social conditions of the middle classes of England had improved, yet their expectation of life had not increased. The matter was brought to the attention of a young lawyer who was interested in such matters, and in 1828 he published a criticism of its conclusions which won the attention of leading social reformers and economists. The name (ever dear to sanitarians) of the lawyer, was John Chadwick, who, as stated by his biographer, began the study merely as a question of statistics; but, as the labor progressed, a new train of reasoning came into his mind, which he called the "sanitary idea," that is to say, "the idea that a man could, by getting at first principles and by arriving at causes which affect health, mould life altogether into its natural cast, and beat what hitherto had been accepted as fate, by getting behind fate itself and suppressing the forces which led up to it at their prime source." Other papers on "Preventive Police" and "Public Charities in France" followed, and Chadwick was greeted by old Jeremy Bentham, then in his eighty-second year, as a disciple of his creed that "the work of the legislator is to enable people to live happily." Chadwick, now seized with the sanitary idea, went slumming in East London and took typhus, and all but became one of the first martyrs to sanitation. He lived, however,

to become secretary of Lord Grey's Poor Law Commission in 1832, and in 1834 we find him installed as permanent secretary of the New Poor Law Board, having acted in 1833 on the Poor Law Commission, in whose report he succeeded in having inserted a clause dealing with the half-time system, by which those children only could be employed who could present tickets of having spent three hours daily in some school during the previous week. Though the Lords amended these proposals somewhat on the ground that they would lead insidiously to a system of universal national education, yet it was soon found that sixty per cent. of the destitute orphan children were going to Poor Law schools; and it may be noted that this is the law in successful operation up to the present day in industrial schools. Of Chadwick's labors during the next five years, Lord John Russell, the father of so many of these parliamentary reforms, said: "For the relief of the destitute and prevention of pauperism, the improvement of the public health and the physical condition of the population, there was no one to whose zeal and assiduity the country is more indebted than Mr. Chadwick." But his labors were to bear further fruit. The dissenters had been urging that the State should undertake the registration of births, marriages and deaths, as well as allow marriages to be celebrated by dissenting ministers. Chadwick saw in this the opportunity to promote the first great principle of sanitary reform by having the causes of death tabulated, thereby establishing a basis for sanitary study and deduction, while the government, to be relieved of a political agitation, followed the lead of Lord Lyndhurst, and in 1836 passed the Registration Act in large measure as it now exists, and the year 1838 saw that distinguished man, Dr. William Farr, installed as Registrar-General. To the study of these returns of the last sixty years every one of us is prepared to say, in the words of Dr. H. W. Richardson, the biographer of Chadwick, "The proverb that pestilence walketh in the dark is no longer true; pestilence, measured and registered, walketh at last in the open day." We have already referred to the distress and discontent succeeding the Napoleonic wars. These, however, were not all or the greatest of the evils. In 1816 typhus and relapsing fever appeared in the rookeries of London, and became epidemic throughout England. Relapsing fever disappeared in 1819, but typhus remained endemic, again becoming epidemic in 1826-7. The year 1826 saw another disease appear, then unknown; but in 1849 through the studies of Drs. Budd and Jenner, it became known as typhoid. But evil followed evil, for the decade between 1830-40 saw Asiatic cholera advance from Russia to Germany and sweep over England in the epidemic of 1832-34; small-pox prevailed in 1836-39, and Russian influenza followed in successive waves in 1831-32. And with this decade, in which the emigration of the population grew in increas-

ing numbers, we see America entering upon those years which were similarly to mark the beginnings of state medicine. Of the period prior to this, Dr. Bowditch, in his "centennial discourse" at Philadelphia, in 1876, briefly writes, "It is the epoch of systems of medicine, wrought out by the imaginations of some few of the leaders of our profession. This epoch believes in drugs, and their almost supreme power over art. It has little or no faith in Nature's ability to cure disease." With the passing of Dr. Benjamin Rush, in 1833, the greatest American physician of his day, this epoch of "Systems of Medicine," in which there was no belief in the *vis medicatrix naturae*, came to an end. The teachings of Louis, a preceptor of Bowditch, were now to influence the medical ideas and practice of the rising generation, and to them Bowditch ascribes the "basis of public hygiene" in America, developed principally by the writings of Bigelow and Bartlett, with Oliver Wendell Holmes. But to return to the scene of the great agitation, which we have seen already as being well advanced, we find that the investigation by Chadwick into the condition favoring the epidemic spread of typhus in London was bearing abundant fruit. Bishop Bloomfield, then of London, realized the full significance of the facts set forth, and threw all his energy and powerful influence into Chadwick's grand sanitary design; and Lord John Russell, in 1839, instructed the Poor Law commissioners "to institute what afterwards became the far-famed inquiry into the health of the laboring classes of the other parts of England and Wales beyond the Metropolis," which report, prepared by Chadwick, was presented to the Home Secretary in 1842. In the next year this indefatigable secretary prepared papers on "Graveyards of London" and "Intramural Interments and Disinterments," resulting in the compulsory establishment of cemeteries outside of towns and cities. The cause was soon to find another champion in that noble man, the Prince Consort, the spokesman of our beloved Queen, whose glorious lifework is not yet completed. Through his great influence, assisting the labors of more active reformers, Sir Robert Peel appointed a Royal Commission consisting of such famous men as Professor Owen, Dr. Lyon Playfair, Mr. Robert Stephenson, Mr. Smith, of Deanston, and Mr. William Cubitt, to report on the whole subject of the health of the nation. This report was published in 1844. Although no immediate legislative action followed, yet in 1847 another commission, with Chadwick as a member, was appointed to inquire into the "sanitary condition of the Metropolis." The evidence of thirty-five witnesses therein set forth was most startling in its effects on the public mind. An immediate result was the formation, in 1848, of the first Board of Health, of which Lord Shaftesbury and Mr. Chadwick were members. And it was none too soon, since a virulent outbreak of cholera appeared in 1849. It

will thus be seen how the "Period of Agitation," together with our "Period of Investigation," employed the energies of the people of England for half a century. But the labors of the ever-increasing band of workers in the fields of pure science, had been gaining in force and directness of aim. In 1831 there had assembled at York individual members of local scientific societies, and the British Association for the Advancement of Science was organized. In its annual reports, which now for seventy years have appeared, have been collected the labors of workers in every field of science. Referring to the isolated position of workers in the field of science the first president of the association expressed a sentiment yet to be repeated with much force, viz., "I do not think it is either politic or liberal to keep those who employ their rarest intellectual endowments in the direct service of the country upon a kind of parish allowance," which was but saying again what Voltaire said of the encyclopedist Diderot, who got but £120 for years for his work, "and then to think that an army contractor makes £800 a day!" We now pass naturally to the formative period of public health which we may properly designate—

3. *The Period of Legislation.*—The formation of the first Board of Health for the Metropolis served to meet the emergency caused by the outbreaks of typhus and cholera which marked these years of great political agitation, with their Chartist risings and Socialist organizations, all grow out of the increasing sense of injury and injustice, for which in the popular mind the rich were in some way responsible. The year 1845 of the potato famine in Ireland presents a picture of misery, the memory of which remains with many yet living, and which from the sanitary standpoint proved of extreme importance to this continent. In the year 1847 very many thousands of the sufferers emigrated to the United States and Canada, and the horrors of the voyage during a passage of many weeks can now be realized only by a visit to the silent burial grounds of the quarantine stations of the Atlantic seaports. During that fatal summer alone 8,639 cases of ship fever, and 5,424 interments took place at Grosse Isle, in the St. Lawrence, where a monument still stands to the memory of the devoted physicians who died at their posts ministering to those unfortunates. From the ports the disease spread inland, and to-day the graveyards of many towns along the great inland waterways have numerous memorials of the years of the ship fever, while the cholera of 1849 added still further to the horrors of the sea-voyage, and to the dangers to the populations along the great immigrant routes of the St. Lawrence and the Erie Canal. The first great measure of reform in England, arising out of this condition of affairs was the abolition of the Corn Laws, described by Lord John Russell as "the blight of commerce, the bane of agriculture, the cause of bitter division among the classes, the cause of penury, fever and crime

among the people." How the hopes of the people were lifted up, accompanied by the deep stirrings of the public conscience may be seen in the literary romances of the time of such writers as Canon Kingsley in his "Yeast" and "Alton Locke," the one dealing with the conditions of the agricultural laborers, and the other with employees of sweat shops, and of Charles Dickens, who in "Little Dorrit" and "Nicholas Nickleby" makes scathing attacks on the prison system and the Yorkshire proprietary schools. Such are but a few of the influences which gave momentum to the social reforms following financial reforms, the results of the work of Russell, Cobden and Bright. Political changes retarded somewhat the development of the public health measures instituted by the "Health of Towns Act" of 1849, and of the first Board of Health, whose existence practically ended with the report of 1854, prepared by Chadwick, now Sir Edward. Its work was thereafter placed under the Local Government Board, combined with the Poor Law administration. Of this great sanitary reformer, whose work now came to an end the political economist, John Stuart Mill, in writing to him said: "I need only mention the Sanitary Department, the importance of which, now so widely recognized, you were amongst the very first to press upon a careless public." Under this first Board of Health was appointed Dr. John Simon as the first medical officer of health, and the City of London Reports, 1849-1854, supply us with the first series of public health reports in which the now every-day subjects of "House Drainage," "Public Water Supplies and their Pollution," "Social Position of the Poor and their Overcrowding," "Offensive Trades," "Smoke Nuisances," etc., are systematically dealt with. With the instincts of a general, Dr. Simon began, in 1853, to prepare for the cholera, which again appeared in 1855, and he has given us in the report of that year not only a history of its progress, but the first comprehensive summary of the sanitary conditions upon which the prevalence of cholera depends. I cannot forbear quoting a paragraph which illustrates how the facts developed in the fields of pure science had invaded the field of practical medicine. He says: "Thus, then, our position stands. Scientific prediction of phenomena can arise only in the knowledge of Laws. That the phenomena of this disease, however capricious they may seem, are obedient to absolute uniformity as yet beyond our ken are enchained by that same rigid sequence of cause and effect which is imposed on all remaining Nature, it would be impossible to doubt." But with regard to larger views on public health we have only to follow the subjects discussed by Dr. Simon in his five successive London Health Reports. In that of 1854 he especially deals with a subject of intense interest to many members of this Association, viz., The Establishment of a Department of Public Health, presided over by a Minister of the Crown.

He says : " But at least as regards its constituted head sitting in Parliament, his department should be, in the widest sense, *to care for the physical necessities of human life.*" Such separate department with its Minister of Health was not to be ; nevertheless, the General Board of Health was continued, and we find Dr. Simon again in 1858 addressing the Right Honorable the President of the Board when making a report based upon the lectures of Dr. Greenhow, Lecturer on Public Health in St. Thomas Hospital, " On the Present Wasteful Expenditure of Human Life in England." Utilizing the Registrar-General's statistics of annual deaths during the twenty years since the Registration Act was passed this paper deals with the causes of deaths, pointing out that " thousands of deaths annually result from diseases which are in the most absolute sense preventable," and goes on to point out in detail the different diseases included in this category. Successive annual reports presented new series of facts, each repeating with gathering strength the truths of preventive medicine ; and we find that the proverb : "*Gutta cavat lapidem,*" was here, as ever, true, for with the reappearance of cholera and typhus in 1865, public health measures were instituted, having a scope hitherto unknown. The government ordered certain scientific researches to be undertaken ; we find medical officers sent to the Continent to study these diseases in the seats of their prevalence, and special investigations instituted in those towns where these diseases had already appeared in England. Expert chemists, too, were engaged in studying the physiology of diseases in man, and now for almost the first time we find governmental intervention in the case of outbreaks of disease in animals. Of these the most important was that by Professor Granger into the causation of rinderpest, which caused enormous losses of cattle both in England and on the Continent. It is in the report of 1869 that we find Dr. Simon first referring to those discoveries which have shed undying glory upon the name of Pasteur. He says, " It will now be seen that the views indicated in Dr. (Burdon) Sanderson's report with regard to the agencies of morbid infection are the views of Schroder and M. Pasteur on the agencies of fermentation and putrefaction." Throughout all this period of legislative progress there had been developing with increasing momentum the influence of those workers in pure science whose early labors have already been referred to in some detail. From time to time workers in the field of natural history had expressed views based upon variations in type through environment of both plants and animals ; but not until the " Origin of Species," by Charles Darwin, was published in 1859, had any scientific hypothesis capable of accounting for biological evolution been given to the public. In 1863 Thomas Henry Huxley published " Man's Place in Nature," and to these works must be credited much of the growth of that method of

thought which has been carried into every field of scientific research during the latter half of the century. To comprehend how the scientific imagination was directed into a hitherto untrodden field, we have to turn to the labors of a school of workers in France, soon to become famous through the discoveries mainly due to the labors of Pasteur, known to his countrymen, as to all others, as *le Grand Maître*. He may, indeed, in the Carlylean sense, be called a "Poet of the Unseen." Following, as a chemist, the studies of Spallanzani and Gay Lussac in the field of fermentation and putrefaction as applied especially to beer, he was soon attracted by Cagniard Latour's and Schwann's experiments proving the relation of the yeast-cells present, to beer fermentation at a time when Helmholtz had seemingly been forced to again support Liebig's stoutly maintained oxygen theory. But in 1857 Pasteur had established the vitalistic theory beyond question, when he proved the presence of rod-like cells distinct from yeast-cells by cultivating a new species of germ in sugar as present also in the souring of milk, wholly apart from albuminoid substances. It became his firm conviction that the fermentative process depended upon the life of the organisms present; and by the introduction of culture solutions gave us the first step in that science which we now term bacteriology. Following this came that other remarkable discovery that certain organisms to which he gave the name *anaërobes*, were paralyzed by the presence of that very oxygen which, till now, had been supposed to be the very essence of fermentative changes in organic substances, and soon proved that the real change was that of the fixation of oxygen during the growth of the bacteria themselves. But this germ theory had many battles to fight before it succeeded against the school of Liebig, especially prominent amongst whom was Pouchet, who taught an old doctrine of spontaneous generation. Not till the battle was renewed in England by Dr. Bastian, as late as 1876, again to be driven out of court by the beautiful experiments of Tyndall on germless air, as shown by rays of light, was the germ theory of *omnis cellula a cellula*, or *omne vivum ex ovo*, to take its place as the discovery which has absolutely transformed medical and surgical practice during the last quarter of the century and given us a practical working basis for that isolation and disinfection in contagious diseases which has reduced the prevalence and mortality to an extent beyond the most sanguine dreams of the early apostles of the new doctrine. Never was prophecy being more truly fulfilled than that of Pasteur: "*Il est au pouvoir de l'homme de faire disparaître de la surface du globe les maladies parasitaires, si, comme c'est ma conviction, la doctrine de la génération spontanée est une chimère.*" All will recall those experiments, published first in 1877, when this savant, who, at first with such trepidation, trespassed on the field of medicine—for as he said he

was a chemist and neither physician nor veterinarian—gave to the world practically all we to-day know regarding anthrax. As in the field of fermentation, others, as Pollender, Rayer and Davaine, and Robert Koch, had already discovered the rod-like bodies in anthrax blood; but it required the wizard touch of Pasteur to give life and meaning to their studies. Never has romance had more fascination than the story of how Pasteur not only proved the *rod forms* to be the cause of the disease, but also showed that the slight difference in the blood temperature of men, animals and fowls played a governing part in the propagation of the disease; and finally, as he showed in 1881, that by heat the virus could be attenuated until vaccine could be prepared for inoculation against the disease. In the words of his disciple and assistant Roux, "medicine had never before witnessed such perfection in experiment, such rigor in deduction, such certainty of application." His further work in the field of immunity, especially with regard to rabies, is now common knowledge, while millions of francs have been saved to France through inoculation with anthrax vaccine, and hundreds of lives been saved from death through the vaccine against rabies. The establishment in Paris of the Pasteur Institute, that magnificent international monument to the genius of the "Great Master," has become for all of us an oft-told tale. Of him, in the closing years of his life, an intimate friend has written, after describing his personal appearance: "That is Pasteur as he appeared to me—a conqueror, who will some day become a legend, whose glory is as incalculable as the good he has accomplished."

4. *The Period of Elaboration and Development.*—As will have been noted, Pasteur's first great discovery, that of the bacillus of anthrax, in 1876, marks the beginning of the fourth quarter of the century, which we have designated the Period of Elaboration and Development. This is, too, the period which may be said to mark the beginning of what we call Listerism in surgery. It was at this time that Tyndall addressed a letter to Pasteur referring to renewed attacks on the germ theory and speaking of "the inattackable exactitude of your conclusions." It was, too, the year of the Centennial Exhibition in Philadelphia, and the holding of the first Public Health Congress in America, shortly to be followed by the outbreak of yellow fever in the valley of the Mississippi, which hastened the establishment of the National Board of Health—of brief but happy memory—and which gave the impulse, owing to which health boards have been established in almost every state or province of North America. In the Republic of Mexico we also find that a Supreme Board of Public Health had been formed as early as 1841, placing that republic in the first rank amongst us in recognizing the duty of the state to deal with public health as a national matter; yet, as pointed out by Dr. Orvananos, it was not till that remarkable man, General Diaz, was made President, in 1876,

that this Board was established on a permanent basis. Thenceforth the evolution of public health work in Mexico has been continuously directed by our confrere, Dr. Liceaga, whose labors during a quarter of a century for his country and for our science entitle him to a first place amongst the sanitarians of this continent, and, indeed, of the world. In no country that I am aware of does there exist to-day a more complete sanitary organization, or one in which the legislative, administrative and scientific functions are better co-ordinated or more efficiently carried out. As the St. Lawrence gateway was that through which cholera was first brought to this continent in 1832, so to the provinces of Canada belongs the honor of very early general health legislation. In 1833 the Legislature of the Province of Upper Canada passed an Act entitled, "An Act to establish Boards of Health and to guard against the introduction of malignant, contagious and infectious diseases in this Province, and for the formation of local Boards of Health"; but as the emergency passed, so the central health authority was discontinued, and not till 1882 was the first Provincial Board of Health, with permanent officers, established in Canada. In England the year 1875 marked the consolidation of public health laws and their extension to the formation of rural sanitary areas and the bringing of the country districts under the same legislation which had applied hitherto to towns. While it has seemed well to confine this history of sanitary progress during the century to those countries of Europe where its first victories were won, yet it must not be forgotten that the needs of the population of the cities of this rapidly developing continent were not forgotten, though, as appears from Dr. Bowditch's paper in 1876, only in eight of forty-eight states had state legislation dealt seriously with public health matters. Since then, as illustrated in Dr. Abbott's admirable summary of public health progress in the United States during the century, what a change is apparent! To-day in this association we find representatives of state organizations from almost every state and province from the Tropics to the Arctic Circle. The three national governments—the United States, Mexico and Canada—lend their dignity to our councils through their official representatives; and what may be termed a system of continental health observatories are reporting weekly the epidemiological conditions which affect 90,000,000 people. National quarantine services co-operate with state boards in protecting seaboard of 5,000 miles in extent against foreign invasion of disease, and many thousands of local Boards of Health are constantly engaged in the routine task of improving local sanitary conditions and suppressing outbreaks of those communicable diseases which formerly spread uncontrolled as epidemics. Thousands of cities, towns and villages, by public waterworks, have caused typhoid fever to become one of the least prevalent diseases, while cholera and yellow fever are rapidly becoming only

a memory. In the field of animal diseases progress on this continent during this period of development has been yet more remarkable. Especially have we seen in the Bureau of Animal Industries of the United States the development of the most extended application of science to a branch of sanitation which the world has ever seen. That it has been due primarily rather to commercial than to health considerations need not lessen our admiration for a work whose progress has been intimately connected with one of the oldest and most active members of this association. To me the history of this organization, embodied in the labors of Dr. Salmon, is one of the highest examples of the rare combination of scientific methods with executive administration which has ever been witnessed ; and one can only conceive what the sanitary progress of the United States might have been had a similar bureau developed, as has the Imperial Health Institute of Germany (public health) in dealing with the diseases of mankind. I have already dwelt much too long, I fear, on the causes which have made the last twenty-five years the golden age of public health. Of the innumerable discoveries in the field of biology one need not speak, for are we not all in some degree a part of them? If Germany has its Koch and Loeffler, have we not our own Sternberg and Salmon and Sanarelli? If Haffkine, Kitisato, Roux and Mansen have shed glory on our science in Eastern lands through their discoveries, so have Welsh, Osler and Councilman lent lustre to experimental medicine on our own continent! In the field of the practical application of science during these twenty-five years on this continent, we may reply in the slightly altered motto of one of your states: "*Si quaris agrum amœnum, circumspice*"—"If you seek a pleasing prospect, look around you." For the century which is ending the task has been accomplished. Said Prof. Tyndall, in 1876: "Science desires not isolation, but freely combines with every effort toward the bettering of man's estate. Single-handed, and supported not by outward sympathy but by inward force, it has built almost one great wing of the many-mansioned home which man in his totality demands." But to the thoughtful observer of society, as we find it to-day, with its strife between capital and labor as an unsolved problem, recalling, with a merciless industrial competition, still making many of our people as galley-slaves, living under unsanitary conditions which are our shame, and existing on husks while our granaries are bursting with corn, the dealings of Providence must appear, as they did to Job of old, very incomprehensible. With Carlyle such an one is forced to say: "Did I not believe that an intelligence is at the heart of things, my life on earth must be intolerable." But for us, with the history of the passing century before us, surely there is room for encouragement. Browning, the poet of optimism, and a sincere believer in evolution, insists on the love of the Creator being immanent and operative in human

life, and in spite of the woes and sorrows of mankind, as ever carrying him upward, nearer to the moral ideal. As he says in Paracelsus :

“ And, man produced, all has its end thus far ;
But in completed man begins anew
A tendency to God.”

For us as scientific workers, who have been students of the world-processes in the aeons which have caused, as Tennyson calls it, “ this fine old world of ours,” to rise out of chaos, it ought not to be difficult to take courage from what we have seen this century to have accomplished in the field of our own science, even though it be but a stone in the edifice. Shall we not enter upon the work of another century with perfect faith as to the ultimate results, trusting in the words of Tennyson :

“ O yet we trust that, somehow, good
Will be the final goal of ill ;
To pangs of nature, sins of will,
Defects of doubt and taints of blood ;
“ That nothing walks with aimless feet ;
That not one life shall be destroyed,
Or cast as rubbish to the void
When God hath made the pile complete.”

TREATMENT OF APPENDICITIS.*

BY J. WISHART, M.D., LONDON.

There is still much diversity of opinion among members of the medical profession on the question of when to operate in appendicitis. In years gone by very radical views were held on this matter, and it was recommended that every case of acute appendicitis should be operated upon at the earliest possible moment. The high mortality, the necessity of long incisions, followed by drainage, the divisions of important muscles and nerves, the weakening of the abdominal wall and the resultant ventral hernias soon taught operators that it was better to wait, especially in first or mild attacks, until there was some sufficient reason for subjecting the patient to operation. Experience showed that patients frequently recovered from rather severe attacks and almost invariably recovered from mild attacks of the disease. It was found, however, that although many attacks could be tided over without operation, the patient was rendered liable to a subsequent and more severe recurrence of the disease.

Accumulating evidence, clinical and pathological, soon taught competent observers that after one attack of inflammation that the appendix is for all practical purposes a diseased organ.

*Read before the Lambton Medical Society, Oct. 10th, 1900.

Appendicitis, then, has come to be looked upon as a common and rather dangerous disease that is almost never got rid of short of an operation.

Operative treatment in this disease is conceded by the majority of practitioners to be the best. As to the time of operating we have yet much to learn. The most important question is not whether to operate in appendicitis but rather when to operate. That great good has resulted from the frequent discussions on the subject is manifest by the successes attending judicious operative procedures, by the steady advance in the study of the pathology of the affection and by more extended knowledge of its symptoms. On all these points there is scarcely any difference of opinion, the really debatable point is when an operation is actually necessary in a doubtful case of acute appendicitis. Any one who has examined an appendix will readily understand that the organ, in order to keep itself free from intestinal contents, works at a very great disadvantage. If this be true of the normal appendix, the difficulties must necessarily increase tenfold by each succeeding attack of inflammation. When there is destruction of the mucous membrane in the appendix, the healing results in the formation of cicatrized tissue, which must necessarily be followed by narrowing and distortion of the lumen of the organ. This condition of things can only make the ability of the appendix to keep itself clear greater and thus court a succeeding attack of inflammation, followed by another point of narrowing. There may be several of these contractions in various stages of development, behind each of which is found a collection of mucus or muco-purulent fluid in a more or less distended space.

An enterolith may be found shut up in one of these spaces, sometimes in close proximity to an ulcer. The danger of perforation in many of these cases is extreme. All who have operated for appendicitis will recall how often the type suggested by this description occurs.

There are, of course, many cases in which the inflammatory process within the appendix is more intense from the first and there is local gangrene or perforation. In view of the fact that defective drainage is one of the most important factors in the production of appendicitis, it is readily understood that the consequences of the accumulation and stagnation of the secretion of the appendix will result in repeated attacks of inflammation. A patient carrying about an appendix in this condition may be suffering from what is termed "chronic appendicitis," that is, although he may never have had an acute attack, he nevertheless is an invalid and suffers from pain and more or less tenderness in the right iliac fossa, intestinal indigestion, abdominal fulness and distress, diarrhea and alternate constipation, general debility and indisposition for work. There is no constant relation-

ship between the condition of the appendix and the symptoms complained of by the patient, although localized pain and tenderness are pretty constant, and palpation is a valuable means of diagnosis. Many divisions of appendicitis have been made pathologically, though we meet with but two, clinically, in the present state of our knowledge: acute and chronic. In the first the great difficulty is the treatment, and much diversity of opinion exists as to what should be done. In the second the treatment is clear, but at times the diagnosis forms the chief stumbling block. In investigating the history in cases of acute appendicitis it is of the most vital importance to try and ascertain whether the patient has had previous attacks or been the subject of chronic appendicitis. In other words, Is this an inflammatory attack in a healthy organ or an acute inflammation occurring in the diseased appendix? The symptoms are well known to us all, but vary much in severity, the three chief being pain, tenderness and rigidity of the right side. The pain is usually paroxysmal, located about the umbilicus and rarely complained of in the situation of the appendix at the beginning of the attack. If complained of at first in this locality it points to a recurrent case: later on, in almost all cases, it is referred to this situation and indicates a circumscribed peritonitis at this point. The pain in appendicitis may be referred to any region of the abdomen, tenderness on pressure is always present. During the first ten or twelve hours, or even longer than this, it may be general, but ultimately it becomes localized over McBurney's point. There are exceptions to this, however. If the appendix is long and pointing in the pelvis it may not be found at all, or only by rectal examination. Rigidity of the abdominal wall, next to pain and tenderness, is the most reliable sign of appendicitis. This is confined to the right lower part of the abdomen and best marked over the appendix. Vomiting is a fairly constant symptom and often occurs after the initial pain and usually subsiding in favorable cases. In unfavorable cases it is regurgitant, continuous and uncontrollable. The bowels are usually constipated, occasionally regular, and not unfrequently diarrhea ushers in the attack. Obstinate constipation is often due to intestinal paresis, the result of septic infection. It is soon followed by distention of the abdomen, and if the vomiting be constant it suggests a fatal termination. The temperature in appendicitis is never very high, seldom reaching more than 103°. It is sometimes high in mild cases, and low in severe ones. In general, it is a most unreliable sign in both diagnosis and treatment. The pulse rate is of much value in appendicitis. If it be regular, strong and proportionate to the temperature it betokens a mild case. If irregular, weak and rapid, the outlook is unfavorable. It is certainly a better guide than the temperature. The actual pulse rate is perhaps not of so much account as its tendency to increase. Willy-Meyer made it a rule to recommend operation when the pulse reached 116° to 120°. Chills are not common from

my experience. In one very severe case, in which chills and irregularity of the bladder were marked symptoms, the appendix was gangrenous. In rapidly fatal cases, cyanosis, profuse perspiration and great restlessness occur previous to collapse. In cases of perforation or rupture of an abscess the pulse increases and the temperature falls. A careful physical examination of the patient assists much in the diagnosis. By placing the hand over the right side we make out, first, rigidity; secondly, tenderness, and in some cases we feel, in addition, a mass. This has frequently turned out to be thickened omentum in my cases. In early first cases it may be mostly due to sero-fibrinous exudate; in late cases it may be an abscess. Sometimes, when quite hard and large, they disappear gradually; there is no reason to suppose the trouble was abscess. No doubt, however, these exudates are prone to become purulent. In a large proportion of cases we can feel surprisingly little, owing to tympanites and rigidity of muscle. Examination by rectum or vagina should be resorted to. It is of much value in cases where the appendix points in the pelvis, and the tenderness absent at McBurney's point. It has been frequently asserted that 80 or 90 per cent. of cases of appendicitis will recover under medical treatment. It has also been held that medical treatment combined with the aid of surgery in suitable cases shows a lessened mortality over purely medical treatment of 12 per cent. Be this as it may, it would seem that medical treatment is suitable in a large proportion of cases during a first attack, and to a less number during a subsequent attack. It might be well, therefore, to say a few words on the medical treatment in acute attacks of the disease. The patient should be kept in bed and have an attentive nurse. He should have a purgative at the beginning of the disease to thoroughly move the bowels; an ice bag should be placed over the appendix. I don't think it matters much what purgative is given, providing it acts properly. It is usual to give calomel in divided doses when the stomach is irritable, and either castor oil or a large dose of calomel when the stomach will not reject it. It is sometimes necessary to use salines in addition, and even enemata in order to secure a good movement and empty the colon. When this is accomplished, the pain is usually relieved for a time at least. In cases mild in character, with a not very irritable stomach, liquid diet may be given every two or three hours. Should the stomach reject this, an enema of peptonized milk alone, or combined with white of egg and whiskey, may be given. Should the pain return after an evacuation of the bowels, and it is found that relief is not afforded by the agents enumerated, the question of operation should next be discussed, as I am no believer in the use of opium in this disease; and this brings us to the somewhat perplexing question as to when we should interfere surgically in this grave abdominal affection. Experience has shown us that there is no symptom or sign or even combination of symptoms or signs that

reveal the pathological condition of the vermiform appendix in acute disease. No rule as to operation can be laid down; each case must be carefully examined, and, after a diagnosis has been made, a line of action decided upon. In private practice the responsibility of recommending an operation is attended with difficulty, whereas in appendicitis the rule of practice is not well fixed. Should the case be seen at the very commencement, and the symptoms, particularly the local, have been severe, and the thought of operation perhaps suggested itself to the physician, it might be well to see the patient three or four times during the first twelve or sixteen hours and carefully note the progress of the case, get the bowels moved by purgation and have ice applied. Should relief be not obtained by this treatment, or should the condition of the patient get worse, it is time enough to think of operation. In many cases with severe symptoms at the onset the patient may be convalescent by the end of the first day. In a large proportion of acute attacks, recovery will take place under medical treatment, and the appendix can be removed afterwards through a small incision with safety, leaving the abdominal wall strong and without danger of hernia. Not infrequently there is a lull in the symptoms after twelve or eighteen hours, due possibly to the purgatives and ice, then suddenly the pain, tenderness and rigidity become aggravated, showing progressive peritonitis. The vomiting which has possibly ceased, reappears, tympanites becomes marked, the pulse reaches 125 or more, and is weak, the temperature gets higher. Such symptoms demand immediate operation. We find in some cases that though both pulse and temperature may be low, the tenderness increases, pain continues in the usual location; there is much prostration of strength. Conjunctival jaundice may appear, and in some cases delirium and great restlessness. This condition also demands immediate operation, or the patient, within twenty-four hours, will develop a septic condition with paresis of the bowel, in which he cannot survive an operation, even for drainage. When all the symptoms of appendicitis are present and are severe, and progressive pain, tenderness, rigidity, rise of pulse and temperature, vomiting, tympanites, restlessness and delirium, the problem is not so difficult. It will be evident, even to the inexperienced, that an operation cannot be done too soon, as the following two cases will demonstrate:

F. H., aged 12 years, a patient of Dr. S. On September 12th, 1898, he was seized with pain in the abdomen, followed by vomiting and tenderness, there was much rigidity of the muscles of the right side and some swelling of the abdomen and some restlessness. I saw the patient in consultation about forty-eight hours afterwards, September 14th; the temperature 102°, pulse 120. The case was operated upon at once, the appendix was club shaped and gangrenous, the slough extending up to the cecum and involving the latter to some extent; drainage was used by iodo-

form gauze, the upper portion of the abdominal wound closed with silk-worm gut. The patient did well, but a fecal fistula resulted. This was carefully dressed by Dr. S., and closed slowly in three months. I examined this patient on August 6th, 1900, one year and eleven months after operation. The abdominal wound had closed completely and there was no sign of hernia; the boy is strong and healthy.

On August 6th, 1900, I was again called in consultation with Dr. S., of Simcoe, to a very similar case, boy, aged 11 years. On August 1st, 1900, he had gone to a picnic, and in the evening commenced to have pain in the abdomen, followed by vomiting, fever, rapid pulse, tympanites, tenderness and rigidity. On the following day the symptoms continued to get worse. The physician desired to have the patient seen by a surgeon, but the parents consulted their family physician by telephone and he recommended delay. There was a lull in the symptoms the third day, after which the tympanites and pulse rate and rigidity got worse, but the pain rather subsided and the vomiting commenced and continued until I saw the patient in consultation on August 6th, 9 a.m., pulse rate 140, of high tension, temperature 99°, facial expression anxious, much tympanitic distention of the epigastrium, regurgitant vomiting of dark fluid; there was no pain; there was no operation performed.

I record the history of these two cases in the practice of one physician. The two patients, males, and of about the same age, were seen at the onset, and the initial symptoms were typical of a grave case—pain, vomiting, tenderness, rigidity, shock. There was no amelioration of symptoms from the first, and the physician, an experienced and most competent man, saw that medical treatment would not save either, and recommended operation. His advice was taken with a favorable result in the first case. In the second it was disregarded, and the advice of another taken who had never seen the patient and who was opposed to all operations in appendicitis.

The operation itself, when done early in these severe cases, is not difficult, particularly if it be a first attack. There has not been sufficient time for any organization of the effused inflammatory products. If the initial symptoms are severe we may surmise a severe infection, and prompt surgical interference is indicated. On the other hand, comparatively mild cases should be left alone until a second or third observation reveals the probable course of the disease.

Cases should not be allowed to drift along, however, unless there are reliable signs of convalescence. Sometimes the early hours of the attack have passed, and the question of operation comes up on the third, fourth or fifth day; here the difficulties have increased immensely. It may appear to the attending physician that the patient cannot live if treated medically. The

surgeon may not be very hopeful should an operation be performed. It happens very frequently that cases are gone into at this somewhat advanced stage, that the symptoms have been mild at the onset or have subsided after the first outbreak or have been obscured by the use of opium. Upon the decision arrived at often depends the life of the patient. Something must be done, however, and at once.

The case should be carefully examined. The character of the pain, tenderness and rigidity is important as determining the width and depth of the area of infection. The local signs are more reliable than are the constitutional; but every sign and symptom and the appearance of the patient should be carefully noted. If, with a localized peritonitis of quite large dimensions, the patient be improving, it would seem better practice not to operate. If, however, the symptoms are increasing in severity, operation is indicated, although not nearly so successful as if done in the early hours. Cases operated upon in this stage of the disease frequently do not recover, and the fact that they frequently die of general peritonitis is significant. It excites the suspicion that the operation is to blame for the collapse of the patient, having converted a localized into a general peritonitis. On the other hand, if let alone for even a day when the symptoms are increasing in severity, the patient may be found hopeless from septic infection. If, then, the patient is improving in these late cases, delay is indicated, because the general exudation becomes absorbed and the inflamed area lessened, the patient improves with time, and an operation can be undertaken with better hope of success. Operation is contraindicated in severe cases suffering from septic infection and on the verge of collapse, with vomiting, extensive peritonitis, obstinate constipation, distended abdomen and rapid pulse, restlessness and delirium. Cases seen in this condition at about the fifth or sixth day from the commencement sometimes get well, it is said, if left alone. I have never seen one recover if operated upon. The presence of a tender swelling, appearing from the fifth to the eighth day, adds to the gravity of the case. This means that pus is forming and limiting adhesions are appearing. In the face of the surgical rule to open abscesses, the question as to the time this should be done with the greatest safety is still in dispute. In a rapidly progressive case, one fear is rupture and general peritonitis. On the other hand, too early interference by operation might precipitate the same accident.

Treves, some years ago, laid down the rule that the longer one waited, the nearer would the pus approach the abdominal wall, and the simpler would the operation become.

In cases where the enlargement is situated near the ilium there is not so much danger in waiting a short time, but if the swelling be situated toward the median line or low down, early operation is indicated. The pus has a tendency to travel in direction of least

resistance, and this is not infrequently either upward toward the kidney and diaphragm, or down toward the pelvis or, perhaps, to make an opening in some of the hollow organs: cecum, colon, small intestine, pleural cavity, bladder or rectum. Although we meet with a good many suppurative cases that do ultimately come to the abdominal wall or point in the loin below the twelfth rib, yet in the large majority the pus will travel in an opposite and much more dangerous direction.

The indication in cases of abscess would seem to be to operate as soon as the surgeon can satisfy himself that pus is present. With ordinary care in walling off the general peritoneal cavity with gauze sponges, the abscess cavity can be opened and wiped dry without contaminating the peritoneal cavity.

Another matter that comes up in the treatment is the question whether the appendix should be removed in all cases. In operations performed early the conditions differ little from the normal, and removal should be the routine practice. Later on, when pus is present and the surrounding parts much changed and thickened by inflammatory deposits, the problem is not so easy. In the first class of cases the operation is conducted very much like one performed between attacks, and, in fact, differs very little from it, except that drainage may be and usually is required. In case of abscess where the general peritoneal cavity is not opened and the wall of the abscess is firm, the average operator might well hesitate before attempting to remove the appendix. In some cases it may be found like a small slough on the abscess wall. When in this condition it is not likely to ever give rise to trouble again. Whether, in a given case of abscess, an attempt should be made to remove the appendix, is often a debatable point, and each operator will have to decide for himself. Much depends upon the skill and experience of the surgeon. For those who only do this operation occasionally I would think the best practice would be to open and drain the pus cavity and not risk the life of the patient by trying to do too much.

VITALITY OF TYPHOID, DIPHTHERIA AND CHOLERA BACTERIA IN MILK.*

BY W. T. CONNELL, M.D., PROF. PATHOLOGY, QUEEN'S UNIV.

The rôle of milk as a carrier of the infective agents of disease is now recognized as a highly important one, but it is not the purpose of this paper to take up all the infective forms so carried, further than to say that, practically, with the exception of the tubercle bacillus, all these infective agents are derived from without. We

* Summary of paper read before Executive Officers of Health Association, at Kingston, August, 1900.

have very numerous forms of bacterial milk infection which leads to manifold disturbances in the body, varying from the simple digestive disturbances of infants, due to chemical poisoning, to non-specific and specific forms of infection. Among the specific morbid agents which may and do frequently infect through milk are the causal bacteria of typhoid fever, diphtheria, cholera and scarlet fever. Numerous outbreaks of all these diseases have been traced to an infected milk supply. At varying periods I have made experiments on the vitality of the infective agents of the three former diseases in milk. These experiments are but yet in their preliminary stages, but I thought it well to place my results up to the present time before the meeting. The experiments have been carried out at the heat of the laboratory, which averages 70° , at times going as high as 76° to 78° , rarely under 64° . This would be the average temperature range to which milk under normal conditions would be kept. Sterilized milk is an excellent culture-medium for all these bacteria under consideration, viz., those of enteric fever, diphtheria and Asiatic cholera. They develop and retain their vitality after a lapse of from three to six months. Tubes have never been kept longer than the latter period, but no doubt living bacteria, particularly of typhoid and diphtheria, could be obtained long after this period.

The diphtheria bacillus in sterilized milk at average summer temperature multiplies quite slowly. As the temperature rises, so does its rapidity of multiplication. But as the room temperature is the average temperature under which milk is ordinarily kept, my observations have been made at this temperature, and nothing has yet been done by me to note the results at higher temperature ranges.

Experiments were made of inoculating sterilized milk tubes with the diphtheria bacillus and the common bacillus acidilactici. This microbe was selected because it is the cause of the common souring and curdling of milk, and because it is practically always present in fresh milk, usually being present in the "fore" milk. In tubes so inoculated the diphtheria bacillus was never noted to increase in numbers, while the lactic acid germ increased enormously. The diphtheria bacilli gradually died out of the milk and were never recovered after the seventh day. The growth of the lactic acid germ in the milk in all my experiments has thus been inimical to the development of the diphtheria bacillus. I may say that to recover the diphtheria bacillus I used blood serum, as in ordinary diphtheria diagnosis. On blood serum, *B. acidilactici* practically refuses to grow at body heat.

Fresh milk was also inoculated with *B. diphtheria* and examined afterwards at four-hour intervals. Here again no increase in diphtheria bacilli was found, though diphtheria bacilli could be recovered up to the fifth day. In all fresh milk samples the lactic acid bacillus was found, and with it such species as *sarcina lutea*, a variety of bacillus coli, a yeast and penicillium glaucum. In competition

in milk with the penicillium glaucum the diphtheria bacillus is quickly killed out, disappearing on the fifth to the tenth day. It seems from my experiments to be proven that at a temperature averaging 70° to 72° F. the diphtheria bacillus, while it remains alive and virulent during the period of time in which the milk is commonly used, yet does not tend to multiply in such milk and is soon killed out in competition with the common milk saprophytes. As these results do not seem to be in line with many facts noted in connection with diphtheria epidemics from milk infection, I mean to again go over my experiments to see if a second series confirm my previous results. The typhoid bacillus at the room temperature multiplies very rapidly in sterilized milk, which affords one of the best media for its rapid development.

In sterilized milk inoculated with *B. acidi lactici*, as well as *B. typhosis*, it was found that both forms multiply rapidly, the lactic acid bacillus exerting no restraining influence upon the typhoid germ during the first two days at least. The typhoid bacillus is readily obtained by subculture six to eight weeks after infection of the milk tubes. In fresh unsterilized milk the typhoid bacillus also increased rapidly in numbers during the first twenty-four hours at least, and could be demonstrated several weeks after in such milk. I may say that in most of my experiments with fresh milk I was much troubled with an actively motile bacillus of the colon type which was frequently present in the milk as obtained within an hour from the dairy.

These experiments show that the typhoid bacillus, once it obtains entry to milk, will readily and rapidly multiply therein and remain alive for long periods. This last point assumes importance in relation to infection of one day's supply from the previous days by the use of improperly cleansed utensils. Epidemics of typhoid from infected milk are usually looked upon as a severe type, perhaps owing to the large number of typhoid germs which could be taken in in this way, and, as is well recognized, the number of infecting bacteria usually exercises an influence on the severity of the infection.

The spirillum of cholera rapidly multiplies in sterilized milk at the room temperature and remains alive in it for long periods. In infection of milk with this microbe and with the lactic acid germ the cholera vibrio multiplies for from six to eighteen hours, when its multiplication is checked by the lactic acid germ, which soon obtains the ascendancy and gradually kills out the cholera vibrios. In most of my experiments the cholera vibrios could not be obtained after forty-eight hours, in none longer than seventy-two hours. Practically the same results were noted in connection with the fresh milk samples. The danger from cholera-infected milk is during the earlier stages of infection, which is, of course, the period when milk is used. Later the lactic acid rapidly kills the vibrio, which, as is well known, is quite sensitive to the effects of acids.

PROGRESS OF GYNECOLOGY.

BY A. LAPHORN SMITH, B.A., M.D., M.R.C.S. ENG., MONTREAL

Appendicitis as a Complication of Pelvic Disease. A number of papers have recently been read on this subject, among the most important being one by Dr. McLaren, of St. Paul, at the meeting of the American Gynecological Society at Washington in May. It has been pointed out that dysmenorrhea, which is a common disease in young girls, is frequently due to disease of the tubes; secondly, that disease of the tubes is often due to infection from the vermiform appendix; and thirdly, that disease of the vermiform appendix or appendicitis is always due to infection by the colon bacillus, and that the colon bacillus increases in number in proportion to the length of time the bowels remain unmoved. My own experience in over a hundred operations for pus tubes quite bear out this theory; for in about fifteen cases the vermiform appendix was adherent to the right tube and in one case to the left tube, and in nearly all there was severe dysmenorrhea. Although gonorrhoea was the principal cause of the pus tubes, yet in some of the cases there was no possibility of this being the case as they were young girls of irreproachable character. Many of these cases occurred in the practice of *confreres* who called me in consultation; in some of them appendicitis had been diagnosed and in others salpingitis, but at the operation both conditions were found to be present, so that there was no mistake in the diagnosis. The lesson to be learned is that the first thing to do in treating dysmenorrhea and inflammation of the right side of the pelvis is to have the bowels thoroughly moved. No reliance must be placed on enemas for this purpose, as they only empty the rectum. Ten grains of calomel followed in five hours by a saline should be given. Several cases have recently been reported where all arrangements had been made for removing the appendix, but as soon as the calomel and saline had moved the bowels the patient rapidly got well. However, when a patient has had more than one attack, however slight, she should have the appendix removed soon after recovering from the second attack, while in severe attacks incision and drainage should be done within twenty-four hours.

Vaginal Hysterectomy for Procidentia. Although it is not very certain for how many thousands of years the womb has been falling out of the body, it is probable that it was the first gynecological disease to receive treatment. Of course, until within the last ten or twenty years the relief obtained by pessaries was

only partial, because, as a rule, the perineum was torn, and the outlet of the vagina at the vulva was as large as any other part of it, so that it was difficult to keep any support in. Large ring pessaries, and stem and cup pessaries held in by a perineal bandage were the most effective, but were very inconvenient, while sometimes quite dangerous owing to the cutting of the pessary through the vagina into the peritoneal cavity. The present methods are much more satisfactory, and have the merit of effecting a complete cure. We have two operations to choose from, according to the degree of prolapse and the size of the uterus. If the uterus is small and not far enough out of the body to have become ulcerated, the safest operation is to make a small incision in the abdomen, and catching the fundus with bullet forceps, draw it up to the opening and scarify the whole anterior surface of the fundus, and then sew it to the abdominal wall with buried chromicized catgut. Then to close up the vaginal outlet by a large posterior colporrhaphy. If, however, the uterus is very long (sometimes it is seven or eight inches deep), and especially if it be ulcerated, it is better to form vaginal hysterectomy, and after bringing the stumps of the broad ligaments together to sew up the roof of the vagina and then to close up the perineum. The objection is often raised that the woman is too old to undergo such operations, but I have found by experience in many cases that there is no foundation for the objection. The two last cases of this kind I operated at the Western Hospital a week ago and two weeks ago, respectively, on women sixty-five years and seventy-five years of age. In the first one I had already done ventrofixation three months ago, followed by colporrhaphy at the same sitting; but the uterus was so long that when the fundus was attached high up on the abdominal wall, half way to the umbilicus, the cervical end with the vagina was at the vulva. In this case I removed the lower four inches of the uterus, and sewed the vagina to the cervical canal remaining. The result seems to be good. In the second case, aged seventy-five, there was a large malignant-looking ulcer on the cervix, due to the cervix sticking to the clothing when she sat down, and I therefore removed the whole uterus, which was about five inches long, and closed the perineum. Although the arteries were very hard and there was an arcus senilis, she bore the operations remarkably well; she was only on the table half an hour for the two operations, and did not lose more than three ounces of blood, most of which was during the perineorrhaphy. She is quite convalescent, with a pulse of eighty. The result promises to be very satisfactory.

MONTHLY REPORT.

Issued by the Provincial Board of Health of Ontario for Sept. 1900. Showing the deaths from all causes and from Contagious Diseases in the Province, as reported to the Registrar-General by the Division Registrars throughout the Province.

Issued Oct. 15th, 1900.
P. H. BERRY, M.A., M.D., Secretary.

YEAR.	MONTH.	Total population of province 2,283,182	Total deaths reported from all causes.	Rate per 1,000 per annum from all causes.	Scarlatina.	Diphtheria.	Rate per 1,000 per annum.	M easles.	Rate per 1,000 per annum.	Whooping cough.	Rate per 1,000 per annum.	Typhoid.	Rate per 1,000 per annum.	Tuberculosis (Consumption).	Rate per 1,000 per annum.
1900.....	Sept.....	Total population reporting 1,040,705 85%	Total deaths reported from all causes 1,063	Rate per 1,000 per annum from all causes 11.6	Scarlatina 2	Diphtheria 40	Rate per 1,000 per annum 0.2	M easles 3	Rate per 1,000 per annum 0.01	Whooping cough 10	Rate per 1,000 per annum 0.1	Typhoid 54	Rate per 1,000 per annum 0.3	Tuberculosis 180	Rate per 1,000 per annum 0.9
1900.....	August ..	Total population reporting 2,271,860 99%	Total deaths reported from all causes 2,371	Rate per 1,000 per annum from all causes 12.5	Scarlatina 8	Diphtheria 31	Rate per 1,000 per annum 0.1	M easles 1	Rate per 1,000 per annum 0.005	Whooping cough 11	Rate per 1,000 per annum 0.07	Typhoid 44	Rate per 1,000 per annum 0.2	Tuberculosis 180	Rate per 1,000 per annum 0.9
1900.....	July	Total population reporting 2,215,940 97½%	Total deaths reported from all causes 2,021	Rate per 1,000 per annum from all causes 10.0	Scarlatina 9	Diphtheria 44	Rate per 1,000 per annum 0.2	M easles 0	Rate per 1,000 per annum 0.01	Whooping cough 7	Rate per 1,000 per annum 0.03	Typhoid 15	Rate per 1,000 per annum 0.08	Tuberculosis 264	Rate per 1,000 per annum 1.4

YEAR.	MONTH.	Total population reporting	Total deaths reported.	Rate per 1,000 per annum from all causes.	Scarlatina.	Diphtheria.	Rate per 1,000 per annum.	M easles.	Rate per 1,000 per annum.	Whooping cough.	Rate per 1,000 per annum.	Typhoid.	Rate per 1,000 per annum.	Tuberculosis.	Rate per 1,000 per annum.
1899.....	Sept.....	Total population reporting 2,265,308 99%	Total deaths reported 1,967	Rate per 1,000 per annum from all causes 10.3	Scarlatina 10	Diphtheria 21	Rate per 1,000 per annum 0.05	M easles 0	Rate per 1,000 per annum 0.1	Whooping cough 8	Rate per 1,000 per annum 0.04	Typhoid 55	Rate per 1,000 per annum 0.3	Tuberculosis 190	Rate per 1,000 per annum 1.0
1899.....	August ..	Total population reporting 2,295,340 98%	Total deaths reported 2,088	Rate per 1,000 per annum from all causes 11.4	Scarlatina 8	Diphtheria 25	Rate per 1,000 per annum 0.04	M easles 5	Rate per 1,000 per annum 0.1	Whooping cough 16	Rate per 1,000 per annum 0.09	Typhoid 55	Rate per 1,000 per annum 0.3	Tuberculosis 172	Rate per 1,000 per annum 0.9
1899.....	July	Total population reporting 2,168,115 95%	Total deaths reported 1,642	Rate per 1,000 per annum from all causes 9.5	Scarlatina 7	Diphtheria 26	Rate per 1,000 per annum 0.04	M easles 4	Rate per 1,000 per annum 0.1	Whooping cough 6	Rate per 1,000 per annum 0.03	Typhoid 15	Rate per 1,000 per annum 0.03	Tuberculosis 178	Rate per 1,000 per annum 1.0

N. B.—Division Registrars will please make their returns on or before the 5th of each month, thus enabling the Department to have the monthly report compiled much earlier than heretofore.

DOMINION MEDICAL MONTHLY

AND ONTARIO MEDICAL JOURNAL

EDITOR:

SEATTIE, NESBITT, B.A., M.D., F.C.S.

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TORONTO, NOVEMBER, 1900.

No. 5.

THE GERMAN BILL.

On other pages of this issue will be found a full text of the measure introduced at the last session of the Ontario Legislature by Mr. W. M. German, then a prominent member of that body, which purports to regulate the traffic in what is ordinarily known as patent drugs, and the advertisement thereof. The Bill is to be reintroduced at the coming session, and in the meantime the patent drug fraternity is busily engaged in working up a case in opposition to the measure becoming law in this province. It is not known to us who, if anybody, other than the promoter thereof, is behind this measure, though it has been hinted by an editorial writer in a Toronto society journal that the College of Physicians and Surgeons have something to do with it; but it is much easier to place the instigators of opposition, which is an organization styling itself the "Proprietary Articles Trade Association of Canada," who have appealed to the daily and weekly press of the province—and not in vain—as well as to the retail druggist, who in former years fattened his revenue from the sale of patent articles, but who, nowadays, makes more from the pushing of his own preparations. The preamble of this proposed legislation sets forth its salient features and its prime principles, viz., "The protection of the public against the fraudulent or improper advertisement of drugs, etc.," and "to license the advertisement or sale of patent or proprietary medicines." This certainly is very important legislation in the public interest, and demands the most careful consideration. Primarily, the advertisement of these articles, manufactured for a gullible public, are for the sole purpose of making money for their promoters, who are, very often, capitalists, seeking avenues for their superfluous wealth. That they are manufactured for humanitarian purposes no one, we think, will be brazen enough to assert. In order to be successful, they must

be advertised to an extraordinary degree, and the commercial wrecks which follow in the trail of this advertising are well known to everybody. That they are ephemeral can be readily demonstrated by comparing the advertisements of a decade ago with those of the present time. No doubt these advertisements are a great contributing factor to the revenues of the press of the province; and, as long as there is money in it for them, they will scarcely disregard the appeals of the organization above referred to. The daily stench arising from these obnoxious advertisements in the press is simply awful, to say nothing of the pamphlets shoved in at our doors, which prove ready instruments to incitement to crime and immorality. Pictures of the private organs, cures for private diseases and methods of procuring relief from the physiological outcome of sexual wrongdoing are daily scarring the pages of our newspapers, and converting a press which should be powerful for good into a press powerful for evil. Is it little wonder that immorality is rife in the present day, when the thoughts of the public are being constantly turned into these channels through these hideous and obscene advertisements? What patent medicine vendor would like to have his shop singled out, or his dwelling-house singled out, as a bill-board upon which to paste a rude caricature of the bladder, seminal vesicles, ejaculatory ducts, and an emasculated penis? Nowadays, everything can be pictured in the pages of a depraved press, except, possibly, the single act of coition, and that will soon enter this arena of shame if morality departments are not alive to their duty.

The German Bill is a move in the right direction of getting rid of this obnoxious advertising, and, when shorn of one or two unimportant items, ought to receive the unanimous support of the legislature.

TORONTO PHYSICIANS' PROTECTIVE ASSOCIATION.

Medical organization throughout the United States is rapidly becoming a matter of practical importance. In Detroit and elsewhere protective associations have been formed for the avowed purpose of bettering the lot and welfare of the physician. In Detroit, over four hundred members of the profession have signed the roll of the organization, which is stated to be working satisfactorily and harmoniously. Shorn of trade-unionism and boycotts, it will prove a powerful factor for good in the profession, and result in the correction of evils and disabilities in that city which will make life worth living. Although nothing definite has been done towards a similar end in the City of Toronto, or in any of the other cities or towns in the Dominion that we are aware of, there is some quiet talk going on amongst the profession in Toronto which will soon

result in definite steps being taken in the direction of the organization of such an association, designed for the purpose of correcting the abuses which exist here, as well as in Detroit and elsewhere, and, it may be, to a more alarming and disconcerting extent than in our neighboring city to the west. It must be apparent and manifest to all that the profession of medicine is drifting woefully, and that it is high time that we were up and doing if we are going to hang together as a substantial section of the community. In no other walk of life are the abuses and burdens more flagrant and depressing than those of which the profession of medicine is the victim. We have even descended to the degrading position of having our charges fixed by our patients, in many instances—a procedure which is fast gaining ground, and a procedure to which even the humblest tradesman is not subjected. A great mass of the public have become seized of the idea that it is not necessary to pay for a doctor, and that the law will uphold them in the contention. If an association were formed on broad professional and ethical lines, on the broad lines of probity and honor, much good could be accomplished, both financially and professionally. Let us at once get to work and do something for ourselves, else we will be crowded out and left in the race after an ordinary livelihood. Let us organize and live up to the tenets of our organization. Let us become more “business” and less “professional.”

MORPHINE AMONGST MEDICAL MEN.

A recent writer in a medical journal states that the morphine habit is prevalent amongst men of the medical profession to the extent of six to ten per cent.—no doubt an exaggerated statement, but a truly alarming one. This is one of the sad things in the profession of medicine, that many go down to physical and mental bankruptcy through the self-administration and indulgence in drugs, powerful for good yet equally potent for evil. Perhaps the profession is peculiarly adapted for this self-inflicted harm, because of the hours of idleness which often fall to the lot of the young practitioner. All of us, probably, know some one, either of our classmates or others, who have become slaves to this vice; and, although it may not have become so universal as the writer in question states, it is widespread enough to cause medical faculties, teaching bodies, and the older members of the profession to raise their voices in emphatic and vehement protest and warning against this besetting sin. To the medical man often is attributed the downfall of the patient; and whilst this may be true in some instances, probably the great majority of these could justly be laid at the doors of the “repeating” druggist. Opium, morphine, chloral, cocaine and chloroform

are drugs which the young, as well as the old, must handle with the utmost care; and whilst it may be necessary for the doctor to administer these to himself in isolated instances, it is much better and in the long run, wiser for him to shun them altogether, and only take them on the advice of another practitioner, and even then it is better for him not to know what he is taking. Tablet triturates and the hypodermic syringe may have had much to do with the growth of these practices, and it might be well for us to revert to solutions in the administration of such dangerous drugs. Albeit, the habit is on the increase within the last decade, not only in the profession, but as well among the laity; and an early and timely warning repeatedly given to the young man who is about to embark upon his professional career, will serve good purpose in preventing these wrecks by the wayside.

THE GERMAN BILL.

Copy of a Bill introduced during last session of Ontario Legislature, to regulate the sale of Patent and Proprietary Medicines or Cures, by Mr. German.

Whereas it is necessary and expedient to protect the public against the fraudulent or improper advertisement of drugs, medicines or cures, and against the sale of such of the same as contain hurtful ingredients, and to license the advertisement or sale of patent or proprietary medicines, and for that purpose to appoint an inspector of the same, and to provide for the payment of a license tax in respect of such licenses;

Therefore Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. Where the following words appear in this Act they shall be construed in the manner hereinafter mentioned, unless a contrary intention appears:

(1) "Medicine" shall include all substances intended to be administered internally, or applied externally to the human body, with a view to the prevention, cure or alleviation of any disorder in its functions.

(2) "Advertise" and "advertisement" shall include all things or proceedings intended to attract the attention of the public to any medicine.

(3) "Registrar" shall mean the registrar of proprietary medicines appointed under this Act for the purpose of carrying into effect its provisions.

(4) "License" shall mean a license granted under this Act, and "licensee" shall mean any holder of such a license.

2. There shall be an officer appointed by the Lieutenant-Governor, to be known as the Registrar of Proprietary Medicines, who shall be attached to the office of the Provincial Secretary. Such officer shall be a member of the Ontario College of Pharmacy, and a regularly qualified pharmaceutical chemist of at least seven years' standing.

3. The duties of the Registrar shall be :

(1) To receive all applications for licenses.

(2) In pursuance of the provisions of this Act, to grant or renew, or to refuse to grant or renew licenses, or to suspend or cancel licenses.

(3) To make and keep a correct register of such licenses and of the dates of their grant, expiry, renewal, suspension or cancellation, and from time to time to cause to be published the information required to be published by this Act.

(4) To keep on file in his office the documents there filed under this Act.

(5) To receive all money payable under this Act.

(6) To enforce all the provisions of this Act, and to collect by due process of law, all the penalties incurred under this Act.

4. For the purpose of his duties under this Act the Registrar may require to be made, and may take and receive affidavits and depositions, and may examine witnesses upon oath ; and the Registrar shall have the same power to summon persons to attend as witnesses, to enforce their attendance and to compel them to produce books and documents and to give evidence, as any court has in civil cases.

5. Every application for a license shall be filed with the Registrar and shall be accompanied by a statement of the formula or prescription of the medicine, duly verified by affidavit or statutory declaration of the applicant.

6. All licenses must be renewed yearly, and the application for the renewal of a license must be filed with the Registrar at least one month before the expiry of the previous year's license, and must be accompanied by an affidavit or statutory declaration similar to that required in the case of an original application.

7. There shall be payable by the applicant upon each application for a grant, or for the renewal of a license, a license tax of \$1,000. This sum shall be deposited with the Registrar upon the filing of an application and shall be returned to the applicant in the event of the refusal of his application.

8. No license shall be granted if the medicine is such that it may be harmful or noxious in the hands of a person ignorant of its composition.

9. If a license be procured by means of any false or fraudulent representation, either verbal or in writing, the Registrar shall, on discovery of the said fact, forthwith cancel the license.

10. No person shall advertise or sell or offer for sale any medicine unless the manufacturer or proprietor of the same is a licensee.

11. No person shall advertise any medicine, in respect of which a license has been granted, by any advertisement—

(1) Which consists in whole or in part of any surgical picture or representation ;

(2) Which is of a nature to suggest the means of committing any crime ;

(3) Which is offensive in its language or suggestion ;

(4) Which is calculated to hold out false hopes of the prevention, alleviation or cure of any disorder of the functions of the body ;

(5) Which is, having regard to the formula or prescription filed, fraudulent or misleading in its statement of the curative properties of the medicine.

12. Where an advertisement is published in a foreign country and copies of such publication are circulated in Ontario, both the person circulating such copies and the person responsible for the publication in the foreign country, shall be deemed to advertise in Ontario so as to fall within the terms of sections 11 and 12 hereof.

14. Where a licensee, by himself or his agent or agents, offends against the provisions of section 11 or of section 12 hereof, the Registrar shall, upon the first offence, notify the licensee and suspend his license until the offence has ceased, and shall, upon a second offence, or upon the continuation of the first offence for one month after notice as aforesaid, cancel his license.

15. No action shall be brought against the Registrar for anything done *bona fide* under this Act ; but any person whose application for the grant or renewal of a license has been refused, or whose license has been suspended or cancelled, may appeal from the decision of the Registrar to a judge of the High Court of Justice of Ontario, at any time within six months from the date of such refusal, suspension or cancellation ; and the court may, upon the hearing of the appeal, make such order for the grant or renewal of such license, or for the removal of such suspension or cancellation, or confirming such refusal, suspension or cancellation, or for further inquiry by the Registrar into the facts of the case, and as to costs as to the court shall seem right in the premises.

16. The appeal may be by motion, notice of which shall be served upon the Registrar, and shall be founded upon a copy of the proceedings before the Registrar, certified by the Registrar ; and the Registrar shall, upon request of any person desiring to appeal, and upon payment of the sum of five cents per folio, furnish to any such person a certified copy of all the proceedings, reports, orders and papers upon which the Registrar has acted in making the order complained of.

17. A list of licensees, with the names of the medicines in respect of which the licenses are issued, shall be published once in every three months in the *Ontario Gazette*, and in one daily newspaper of the City of Toronto, and in one weekly newspaper in each county and district town in the Province; and the production of any paper containing such list purporting to be issued by the authority of the Registrar shall be *prima facie* evidence in any Court or before any Magistrate, of the existence at the date of publication of the licenses therein set forth.

18. If any person wilfully procures or attempts to procure himself to be licensed under this Act by making any false or fraudulent representation or declaration, either verbal or in writing, he shall, on conviction thereof before any justice of the peace, incur a penalty of not less than \$100 nor more than \$500; and every person knowingly aiding and assisting him therein shall, for such offence, on conviction thereof, incur a penalty of not less than \$20 or more than \$100.

19. Any person who shall, contrary to the provisions of this Act, advertise or sell or offer for sale any medicine, the manufacturer or proprietor of which is not a licensee, shall, on conviction thereof before any justice of the peace, incur a penalty for the first offence of not less than \$50 nor more than \$100; for the second offence, of not less than \$100, nor more than \$500; and for any subsequent offence, of not less than \$200, nor more than \$1,000.

20. Any person who shall, contrary to the provisions of section 11 or of section 12 hereof, improperly advertise a medicine, shall, on conviction thereof before any justice of the peace, incur, in addition to any other penalty in this Act provided, a penalty for the first offence of not less than \$20, nor more than \$50; for the second offence, of not less than \$50, nor more than \$200; and for any subsequent offence, of not less than \$100, nor more than \$500.

21. None of the provisions of this Act shall apply to the advertisement or sale of herbs as gathered, or of uncompounded extracts not advertised as medicines, or of any medicine described as such in the British Pharmacopeia, or of any mechanical device to be used in aid of the crippled or sick, nor to the sale of any medicine upon the prescription of a duly registered medical practitioner.

22. It shall be the duty of every County Crown Attorney to aid in the enforcement of the provisions of this Act, and for that purpose to act under the instructions of the Registrar; and the fees due for their services in that regard shall be paid by the Registrar.

News Items.

Dr. HOWARD T. BARNES has been appointed senior demonstrator of physics of McGill University.

Dr. J. ALLEN WILLIAMS has been appointed lecturer in physiology and hygiene at McGill Normal School, Montreal.

Dr. A. HOLMES SIMPSON, Winnipeg, has been appointed by the Provincial Government of Hamilton, chairman of the Provincial Board of Health of that province.

Dr. MORRISON, a graduate of Queen's, has been appointed house surgeon of the New York Polyclinic Hospital out of upwards of fifty applicants from the United States and Canada.

CONGRATULATIONS are in order to Dr. T. G. Roddick upon his re-election to the House of Commons. It would have been a distinct loss to the medical profession and to the country had Dr. Roddick been defeated.

THE first annual luncheon of the Alumnae Association of the Toronto General Hospital Training School for nurses was held recently in the Temple Café. The president, Miss Alice J. Scott, presided and about forty-five nurses sat down.

AT the annual dinner of the medical students and faculty of Bishop's College, Montreal, recently held in that city, Dr. Wolfred Nelson, of New York, was present and replied to the toast of "Alma Mater." He was the first student ever registered on the rolls of the college.

THE following is a summary of the number of cases of diphtheria in the city of Toronto since 1887: 1887, 618; 1888, 498; 1889, 320; 1890, 433; 1891, 1,039; 1892, 1,625; 1893, 683; 1894, 338; 1895, 506; 1896, 562; 1897, 719; 1898, 426; 1899, 500, and 609 cases up to the end of September in the present year.

DURING the past summer the following well-known scientists did some splendid work at the Government Marine Biological Station at St. Andrews, N.B.: Dr. Joseph Stafford, Toronto; Dr. A. Y. Scott, Toronto, and Professor McCallum, Toronto; Professor Prince, Ottawa; Professor McBride and Dr. Jackson, Montreal; Professor Knight and Dr. Fowler, Kingston; and Dr. Mackay, Halifax. The station is likely to go to Prince Edward Island next year.

At a meeting of the Board of Management of the Victorian Order, held in Montreal recently, the secretary, Professor Bovie, read the report of the work of the Order throughout the Dominion. Twenty-five branches are now in existence in the Dominion and a staff of thirty nurses attended to over 700 cases the past year.

At the banquet tendered in his honor by the Board of Trade of the city of Toronto, Lord Strathcona spoke of the good work Dr. Roddick was performing in endeavoring to bring about Dominion Registration. He considered it a very important matter, and thought it would do a great amount of good in bringing the several provinces closer in touch with one another.

Dr. J. T. HALSEY, a graduate of Columbia College, New York, has been appointed superintendent of the Morrice Pharmacological Laboratory at McGill University. The faculty of medicine at McGill is indebted to Mr. Morrice, of Montreal, for the equipment of this much needed laboratory, who promises to support it by an annual donation for the next five years to enable the university to carry on original research in this department. Dr. Halsey, after graduation, spent a year as interne in St. Luke's Hospital, New York. He then proceeded to Germany where he has spent the past five years in chemical, physiological and pharmacological work in the laboratories of Freiburg, Strasburg and Marburg. In October, 1898, he received the appointment of assistant to Professor Hans Meyer, in the University of Marburg, a position which he has resigned to accept the appointment at McGill.

NATIONAL SANITARIUM ASSOCIATION.—The annual meeting of this association was held in Toronto on the 3rd inst., the president, Chief Justice Sir William Meredith, occupying the chair. During the three years work of the Muskoka Sanitarium, 371 patients have been received, of whom 47 are still under treatment. The number discharged apparently cured has been 57; with disease arrested, 95; with marked improvement, 78. The average stay of the patients has increased each year, and this year it amounted to 129 days. At the beginning of the hospital year on the 1st of October, 1899, 48 patients were present, and during the year 141 more have been admitted, making a total for the year of 189. Of these 43 were from the city of Toronto, 130 from other parts of Ontario, four from other provinces of Canada, and twelve from the United States. Out of the total 122 patients remained in the institution over three months, and of these 109 gained in weight, six lost in weight, and seven neither gained nor lost. The total receipts for the year were \$19,020; the expenditure, \$20,000. Dr. J. H. Elliott, the medical superintendent, is still in Europe studying the methods pursued there in regard to sanitarium treat-

ment for consumptives, Local physicians sending patients to Muskoka, in the opinion of the management, should advise a longer stay on the part of the patient. The institution needs further financial support, as it is owing to this drawback that the free department for the treatment of the consumptive poor has been delayed in opening.

TRAINING SCHOOL FOR NURSES.—On Friday evening the 9th inst., took place the graduating exercises of the Toronto General Hospital, which was followed by a reception in the nurses' new home adjoining the hospital. This has recently been erected at the cost of \$20,000, and is said to be the largest and best equipped in the Dominion. It adjoins the main building at the west end, and is four stories high. It has accommodation for seventy-five nurses. Miss Snively, the lady superintendent of the Training School, read the nineteenth annual report: 650 applications had been received during the year, of whom twenty-five were granted admission. At the present time there were eight probationers and fifty-nine pupil nurses. The graduates now number 317, of whom 233 were still engaged at the work. The following is a list of the graduating class: Miss May Adams, Lakeview, Ont.; Miss Edythe Black, Fergus, Ont.; Miss Lettie E. Bronson, Toronto; Miss Allie Maud Bole, Sault Ste. Marie; Miss Mary Alice Bastedo, Newmarket; Miss Mary Helen Drury, Toronto; Miss Elena M. H. Eyres, Millbrook; Miss Ada Eleanor Findlay, Toronto; Miss Mary E. Graham, Udora, Ont.; Miss Caroline C. Moore, Iroquois; Miss Martha Young Morton, Holland Landing; Miss Mabel Orchard, Shedden, Ont.; Miss S. Caroline Ross, Clifford, Ont. Miss Morton received Dr. O'Reilly's special prize for the highest number of marks.

Physicians' Library

Twentieth Century Practice of Medicine. An International Encyclopedia of Modern Medical Science. By leading authorities of Europe and America. Edited by THOMAS L. STEDMAN, M.D., New York City. In twenty volumes. Present volume XIX. Malaria and Micro-organisms. New York: William Wood & Co., 1900.

Volume nineteen of this magnificent work has the following as contributors: Amico Bignami, M.D., Rome; Simon Flexner, M.D., Philadelphia; Ettore Marchiafava, M.D., Rome; and Eugene L. Opie, M.D., Baltimore. Bignami and Marchiafava deal with malaria, while Flexner and Opie contribute chapters on micro-organisms. At the very beginning there are eleven plates, illustrating malaria,

by the two Italian authors. It had been expected that this article on malaria would have appeared a year ago, but at that time there was so much going on in the way of investigation of the relation of the mosquito as a causative factor in the production of malaria that it was found necessary and essential to rewrite much of the work, and also to wait developments regarding the progress of those investigations. Much has been accomplished in this direction during the past twelve months; and the question, which is one of very great moment to the physician, of the mode of entrance of the parasites into man, has been abundantly proven by experimental research, more particularly probably by Ross and his school of followers. The elaborate production on the subject of malaria will for a long time stand as a classic, and be considered as the standard work for reference on the whole subject.

The chapters on the micro-organisms, by Flexner and Opie, will take high rank with other similar articles and works on the same subject. Their names are so prominently linked with these branches that it will be sufficient to know that they are the authors to commend the work to the medical public. The entire work—"Twentieth Century Practice of Medicine"—occupies an exalted position amongst medical publications.

Diseases of Children. Medical Diseases of Infancy and Childhood.

By DAWSON WILLIAMS, M.D., London, Fellow of the Royal College of Physicians of London, and of University College, London; Physician to the East London Hospital for Children, Shadwell. Second edition, revised, with additions by FRANK SPOONER CHURCHILL, M.D., Instructor in Diseases of Children, Rush Medical College, in affiliation with the University of Chicago; Professor of Pediatrics, Chicago Polyclinic. Illustrated with 72 engravings and 2 colored plates. Cloth, \$3.50, net. Philadelphia and New York: Lea Brothers & Co., Publishers.

This work of Williams is a reliable one, and will be found so by the general practitioner whose specialty is diseases of children. The student of medicine will find, as he peruses its pages, that it is clear, and will stand him well as a practical guide for examination purposes, and afterwards will not leave him wanting in actual practice. The first edition is well and favorably known to the reading medical fraternity in this country, as well as in the United States; but it has been thought well on the part of the American publishers to have a second edition prepared and specially revised for American practitioners. This work has been done, and done well, by Churchill, whose long and ripened experience as a clinical teacher especially qualifies him for the work. The work will be found to

conform to the United States Pharmacopeia, and, where the views of the English differ from the American authorities, these are represented in the text. A section has been added to this edition, on modern infant feeding, which adds materially to the value of the work. An examination of the prescriptions scattered throughout the book, and arranged in tabulated form in the rear pages, shows them to be carefully prepared, and anyone employing them will know their worth by experience. The work can safely be placed in the library of any one who wishes to have an authority safe and reliable to go by. The student will find it a concise, clear textbook.

Atlas and Epitome of Gynecology. By Dr. OSCAR SCHAEFFER. Authorized translation from the second revised and enlarged German edition. Edited by RICHARD C. NORRIS, M.D. Price, \$3.50, net. Philadelphia: W. B. Saunders & Co. Canadian Agents: J. A. Carveth & Co., Toronto.

This work contains 272 pages of text, 90 plates, having 207 colored illustrations and 62 line-work and half-tone figures. The plates are well executed and beautiful in design, most true to nature, and many of them have been taken from the living subject, whilst others are post-mortem and following operations. To the practical gynecologist the work will be a great help, whilst to the student it will go far towards making him thoroughly master of this branch of surgery.

A Treatise on Mental Diseases. Based upon the Lecture Course at the Johns Hopkins University, 1899, and designed for the use of Students and Practitioners in Medicine. By HENRY J. BERKLEY, M.D., Clinical Professor on Psychiatry, the Johns Hopkins University; Chief Visiting Physician to the Insane Asylum at Baltimore. With frontispiece, lithographic plates and illustrations in the text. New York: D. Appleton & Co.

Here is a book which will receive a warm welcome from the medical profession. It is a great book on a great subject, and there will be sure to be a great demand for it. Gotten up in elegant type and style, most beautiful in workmanship from the publisher's standpoint, it is certainly a pleasure to examine and read its pages. No doubt it will take rank at the very front of other productions on the same subject, which cannot be said to be at all overdone by brilliant writings. No bookshelf can afford to be without it; no general practitioner will be doing his practice or himself justice who neglects to secure a copy, as it treats of a sub-

ject which is all too freely and frequently skirted by the busy man. As a systematic treatise on the important subject of mental disorders, emanating from the hands of such a brilliant and undoubted authority as Dr. Berkley, we may be sure that it will stimulate effort in the direction of a proper grasp and conception of these ailments occurring among an unfortunate class of the community, who ought to demand and secure our best care and consideration. The alienist will be sure to adopt it as a standard.

Clinical Examination of the Urine and Urinary Diagnosis. By J. BERGEN OGDEN, M.D., Instructor in Chemistry, Harvard University Medical School; Assistant in Clinical Pathology, Boston City Hospital; Medical Chemist to the Carney Hospital; Visiting Chemist to the Long Island Hospital, Boston. Illustrated. Philadelphia: W. B. Saunders & Company. Canadian Agents: J. A. Carveth & Co., Toronto. Price, \$3.00.

A careful examination of this book will show that while concise it is yet thorough, and contains the most and best approved working methods, both qualitative and quantitative. It will undoubtedly rank as one of the most complete works yet issued on the urine; and a very noticeable feature especially valuable are the chapters on diagnosis, in which disease of the urinary organs is handled in a masterly manner. That section relating to disease outside of the urinary tract will also be duly appreciated; and students and practitioners who want to secure a work of high merit on urinary analysis will here obtain a volume which will be sure to give them perfect satisfaction. We bespeak for this book of Ogden's a place of rank amongst the other works on the same subject.

Manual of Otology. By GORHAM BACON, A.M., M.D., and CLARENCE JOHN BLAKE, M.D. Second edition, revised and enlarged. With 114 illustrations and 3 plates. Price, \$2.00. Philadelphia and New York: Lea Brothers & Company.

One of the handiest and most important volumes which we have read and examined for some time. To the student it will prove a boon indeed; to the general and busy practitioner it will prove a practical hand-book. Twenty-five pages of new matter has been added to the present edition. It is a really valuable exposition on the subject of diseases of the ear and their treatment.

A Manual of Personal Hygiene. Edited by WALTER L. PYLE, A.M., M.D., Assistant Surgeon to Wills Eye Hospital, Philadelphia. Illustrated. Philadelphia: W. B. Saunders & Company. Canadian Agents: J. A. Carveth & Co., Toronto. Price, \$1.50 net.

The contributors to this neat and handy little volume are all eminent men in their respective subjects, and have dealt with little but important things of every-day life. The book is one which bristles with important points on which a knowledge will bring great comfort often to the laity. It contains so many valuable items that we believe it would not be amiss to place it in the hands of the public.

PAMPHLETS RECEIVED.

"The Growth and Regeneration of the Tail of the Frog Larva." By ROSS GRANVILLE HARRISON, Assistant Professor of Anatomy, Johns Hopkins University, Baltimore. Reprint from Johns Hopkins Hospital Bulletin. No. 103, October, 1899.

"A Crushable Button as an Aid to Suturing in Intestinal Anastomosis." By R. C. COFFEY, M.D., Portland, Oregon. Reprint from *Medical Sentinel*, August, 1900.
