PEPPER (Wm)

FIRST

PAN-AMERICAN

MEDICAL CONGRESS

PRESIDENTIAL ADDRESS

BY

WILLIAM PEPPER, M. D., LL. D.

PRINTED BY ORDER OF THE INTERNATIONAL EXECUTIVE COMMITTEE.

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SEPTEMBER 6TH, 1893.

AN ADDRESS

BEFORE THE

FIRST PAN-AMERICAN MEDICAL CONGRESS,

SEPTEMBER 6th, 1893,

IN THE CITY OF WASHINGTON, D. C.,

BY THE PRESIDENT OF THE CONGRESS,

WILLIAM PEPPER, M. D., LL. D.,

PROVOST AND PROFESSOR OF THE THEORY AND PRACTICE OF MEDICINE IN THE UNIVERSITY OF PENNSYLVANIA.

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FIRST PAN-AMERICAN MEDICAL CONGRESS.

ADDRESS DELIVERED BY DR. WILLIAM PEPPER, PRESIDENT OF THE CONGRESS,

SEPTEMBER 6th, 1893.

Gentlemen of the First Pan-American Medical Congress:

THIS occasion is an unique one, and the thoughts which force themselves on the minds of all of us are, I am convinced, so similar that the briefest greeting might well seem the most fitting address. But when I reflect that I stand here to represent the original committee appointed in pursuance of the resolution which was adopted unanimously on May 5th, 1891, at the meeting of the American Medical Association, and that this resolution extended a cordial invitation to the medical profession of the Western Hemisphere to assemble here in a Congress, I realize the unusual dignity of the duty I must discharge. If anything could add to the dignity of this assemblage, which for the first time asserts formally the organic union of the physicians of all America, it is the fact that the Congress of the United States, impressed with the importance of our proposed meeting, passed a Joint Resolution (July 18th, 1892), requesting the President to extend those invitations in response to which we welcome the presence here of official Delegates from all the Governments of the Western Hemisphere. In like manner are the several States of our own Union, the principal municipalities, and many of the leading educational institutions, both of North and South America, represented officially. You will not, then, think it strange that, called upon to address such an assemblage in this Columbian year, it should seem less fitting to dwell upon any

technical topic than to turn our thoughts to the state of this continent and of its aboriginal inhabitants at the time of its discovery by Columbus, and to the obstacles which opposed him and the great men who completed his work. For these have had a bearing on the racial developments which have since occurred here, and should be held in mind in any estimate of the progress we have made during the subsequent four centuries. The state of medical science in Europe at the time of the Discovery, and the spirit which has controlled its subsequent course, are fitly to be studied in connection with what we have accomplished during the same period and with the opportunities which present themselves to us at this time.

The recognition of the appropriateness and importance of this great meeting has been immediate and universal. International although it is, the basis of its organization and the special features which mark it, remove all possible suspicion of an imitation of, or of interference with, the great International Congress whose successive meetings form a crescendo scale of scientific and administrative triumphs which the medical profession of the world regards with justifiable pride.

Our Executive Committee, and our efficient General Secretary to whose unselfish energy and masterly powers of organization we owe a great debt of gratitude, studiously avoided the possibility of any such interference by delaying the selection of a date for our meeting until that of the Congress at Rome was announced, and by then adopting a date which not only permitted but encouraged the presence later at Rome of those who should gather here. I can only add my deep regrets that the unhappy reappearance of cholera in Southern Europe—striking example as it is of the urgent importance of the very work which calls us together—has necessitated a postponement until next spring, a postponement which, however, there is no reason to fear will lessen the complete success of the meeting on its newly-announced date. The International Medical Congress is, indeed, a splendid demonstration of the solidarity of the profession and of the world-wide scope of the objects we pursue.

This Congress represents much more, however, than our common interest in medical science and the common feeling of brotherhood which animates the entire profession. It is, indeed, it always has been, and forever may it so continue, the glory of the medical profession that their allegiance is one and undivided, for their service is solely in the cause of truth and humanity. Dynasties have risen and crumbled; the map of the world has been changed times almost without number, but the march of medical science through the ages has been ever onward and upward towards those lofty goals—the prevention of disease, the relief of suffering, the improvement of the race.

For us who meet here there is all of this glorious recollection and animating purpose, and there is much more to unite and to inspire us. We meet under the shadow of giant conceptions, as old as Aristotle, which agitated the minds of the great thinkers of antiquity, and were but slowly approaching a definite form when the sublime faith and genius of Columbus solved the problem of the globe.

It is true that this vast American continent, with its sixteen million five hundred thousand square miles of territory, already numbers one hundred and ten millions of inhabitants, embracing all types of human life, and many varieties of political organization. But all that has yet been accomplished is but the feeble beginning of the development which awaits us. When Canning secured the recognition of the Republics of South America, he boasted that he had called the New World into existence to redress the balance of the Old, and yet the luminous suggestions of Franklin, of Bolivar, and of Blaine as to the political and commercial relations of the countries of the Western Hemisphere are still only prophesies which must long await their fulfillment.

The destinies of nations are slowly evolved, and occurrences which fill the horizon of a generation appear to the broad gaze of history as mere features in the great panorama of the ages.

Even a period of four hundred years is but a fraction of the history of Spain, of France, of England. Yet four hundred

years ago this entire continent was not only undiscovered and unknown, but its very existence was unsuspected save in the ingenious speculation of philosophers. We recall the familiar but ever interesting lines of Seneca:—

> Venient annis sæcula seris
> Quibus Oceanus vincula rerum
> Laxet, et ingens pateat tellus,
> Tiphys que novos detegat orbes
> Nec sit terris ultima Thule—

and do not marvel that their strain of glowing conviction should have led Columbus to write them out twice over in his "Profecias." But all the same, this New World lay shrouded in the obscurity of the great Sea of Darkness, cut off, as we have since learned, from the known inhabited world, by changes wrought in remote geologic eras, and waiting the fullness of time which should lead the inspired genius of Christopher Columbus to seek the east by sailing west. We now know that in his quest of a western passage to Asia he reached the eastern shore of this continent on October 12th, 1492, but even to the time of his death, on January 20th, 1506, neither did Columbus nor any voyager or writer have any conception of the vastness and real significance of his discovery. All that the geographical knowledge of the day enabled them to grasp was the belief that Columbus had found a new route to the Indies by sailing west. Within a few years, however, the daring sailors of Spain and Portugal, of Italy and of England, pushed their voyages along the coasts. The astonishing discoveries of Americus Vespucius on his celebrated third voyage in 1501-02, when between Lisbon and the Island of South Georgia he traversed an arc of ninety-three degrees, led him to apply for the first time to this continent (it really was South America of which he spoke) the title of New World (Mundus Novus). It concerns us not to consider further how, by no intent or design of Vespucius, portions of South America at first, and later the entire continent, came after his death to be named after him. Yet when a few days ago I held in my hands the little quarto published in 1507, in which Professor Martin Waldseemüller,

of the College of Saint Dié in Lorraine, first suggests the name America, in utter ignorance that the coast explored by Vespucius was continuous with or even related to the land discovered by Columbus, I could not help smiling sadly at the frantic and fruitless efforts we make to secure immortality by our petty observations, while here Fame, in strange whimsey, threw her laurels for the greatest discovery ever made around the head of one who neither had nor preferred a claim to it.

Geology and paleontology have taught us that this so-called New World is in reality, in a scientific sense, better entitled to the name of the Old World. The oldest known strata have their widest development on its surface, and animals, such as the horse, which are said to have been introduced after 1492, are shown to have had their original habitat here and to have migrated hence to Europe, so that Cortes and Pizarro only reintroduced them to their former home. It is more important to recall the fact that the entire stretch of North and South America was, at that date, 1492, peopled more or less thickly with the descendants of tribes who had resided here from very remote antiquity. A high authority assures us that the number of these aborigines was probably from twelve to fifteen millions, and in spite of considerable differences in physical appearance, as between the Iroquois of New York and the Aztecs of Mexico or the Incas of Peru in dialect and habits, it is generally conceded that this vast aboriginal population, of North America and South America alike, with the exception of the Eskimos, belonged to one great race of Red Men.*

In regard to the Eskimos, the polysynthetic or incorporative character of their system of word-building, in which they

*It is evident that the word race is used here in its broad ethnical sense. The English, the French, and the Greeks are different branches of one race from this point of view. No doubt, as John Fiske observes, "the Mexicans encountered by Cortes differed from the Iroquois encountered by Champlain as much as an Englishman differs from an Albanian or a Montenegrin," but when we are contrasting aboriginal Americans with white men or yellow men, it is right to say that Mexicans and Iroquois belong to the same great red race.

resemble the other aborigines of this continent, does not seem sufficient to counterbalance the marked dissimilarity in physical characteristics, and, still more, the strong chain of evidence which goes to identify them with the extinct Cave men of Western Europe. Professor Dawkins (" Early Man in Britain ") has especially developed this important argument. So striking is the resemblance of recent Eskimo remains to those in the Pleistocene caves of France and England, that they are pronounced by competent authorities to be indistinguishable. The extraordinary talent of the Eskimos for the artistic sketching of men and beasts is unique among savage peoples, with the single exception that among the remains of the European Cave Men many sketches, showing a similar talent, have been found. The musk-sheep, which were the inseparable attendants of the Cave Men, no longer exist save in subarctic America among the Eskimos, but the fossilized bones of these animals " lie in a regular trail across the Eastern Hemisphere, from the Pyrenees through Germany and Russia and all the vast length of Siberia."

Eskimos and Red Men alike seem to have migrated to our continent at one time, or more probably in successive waves, in the remote past, either when the northwest corner of America was joined to Siberia by the elevation of the area now known as Bering Sea, or when the lofty submarine ridge which now passes from France to Greenland was elevated so that it would be possible to travel on foot from Europe to America. If the attempt be made to decide at what period of geologic time such immigration occurred, and whether in one great migration, or, as seems most probable, in successive waves, problems of extreme if not insurmountable difficulty present themselves.

The aborigines who were living on this continent at the time of its discovery by Columbus presented, it is true, considerable differences in the stage of development they had reached, as well as in their language and even in their appearance. There are long intervals of social development evident between the squalid sty of the California savage, the long-house of the Iroquois, and the great structures of Zuñi, of Tlascala,

or of Uxmal. Yet in them all can be demonstrated an underlying principle of adaptation to a certain mode of communal life such as all American aborigines are believed to have practiced. All attempts to distinguish the existence of special races, as of the mound-builders, have broken down in the light of critical study, and the powerful arguments of philology confirm the results of zoological study as to the essential unity of the American red race. The tribes in different parts of this vast territory certainly presented marked differences in physical appearance, and our ethnological collections show that as regards size and weight of frame and shape of skull considerable variety existed among them. But all possessed the cinnamon-colored or copper-colored complexion, the high cheek bones and small, deep-set eyes, the straight, black hair, with scanty or absent beard; and the conclusion of the most competent authorities is that no sufficient differences, physical, linguistic, or social, existed to invalidate the evidence in favor of the unity of the race.

Fortunately we are not called on to attempt to read the geological record. For our purpose it is indifferent whether all the relics of the ancient Americans are of the neolithic type, or whether the apparently plausible claim be ultimately established that paleolithic remains are also found in various places. This at least we know, that the soil and climate had shown themselves favorable to the development of a population already numerous, vigorous, hardy, and enduring, and brave and warlike, though often cruel, and evidently advancing in social development, though at very different rates at different localities. Ignorant as we are of their primitive origin, it is doubtful if the most earnest advocate of the monogenist* view that all mankind was originally descended from one pair, will urge that our aborigines were descended from a single couple, or even from a few boat-loads of Asiatics accidentally

*As is well known, the tendencies of natural science are strongly towards this view. Philologists seem disposed to agree that on account of the mutability of language, especially when unwritten and while in its earlier stages, no conclusion adverse to the monogenist doctrine can be drawn from the diversities of speech now existing, or that are known to have existed at any past time.

carried to our Pacific Coast, or that we shall hear again the arguments drawn from the many striking resemblances between the myths, languages, customs, or hand-wrought objects of the aboriginal Americans and of various Oriental nations. The surprise which, I am sure, all of us have experienced at these resemblances must be checked by these two thoughts so well expressed by Fiske and by Lubbock respectively, that one of the most important lessons impressed on us by a long study of comparative mythology is that human minds in different parts of the world, but under the influence of similar circumstances, develop similar ideas and clothe them in similar forms of expression; and again, that different races in similar stages of development often present more features of resemblance to one another than the same race does to itself in different stages of its history.

An immense amount of sympathy has been expended upon the cruel treatment of the American aborigines by the European invaders. Of course, it was the sad old story, so often repeated, whenever a better armed and more highly civilized power has come into conflict with a primitive, ignorant, and ill-armed people. Over the ghastly picture of Indian slavery one would indeed wish to draw a veil, though its darkest shadows are relieved by the splendor of the character and labors of the illustrious Las Casas, and by the enlightened action of those great men, Emperor Charles V., Pope Paul III., and Cardinal Ximenes. But it is a romantic extravagance to deplore the destruction of any system of government or society which existed in 1492 in any part of the continent.*

*It may not be amiss to give here a brief abstract of the ingenious method suggested by the late Lewis Morgan, of Rochester, N. Y., for gauging the real status of primitive peoples in an ethnical scale. It is obvious that any such scheme will be open to criticism, and it is not surprising that archæologists are divided as to the merits of this particular plan.

The ethnic stages, according to Morgan, are savagery, barbarism, and civilization, and in each of the lower two stages there are three subordinate periods.

The distinction between savagery and barbarism is marked by the point where the manufacture of pottery is begun. In the lower status of savagery men lived in their original restricted habitat and subsisted on

If the present state of the native Indian population in North and South America is far from satisfactory, and fails to fulfill the promise shown, especially in South America during the first century after the conquest, may this not fairly be attributed to unwise legislation by the ruling nations, to the absence of continued, effective religious instruction, and to the base cupidity which has led us to promote the fatal passion for stimulants, so common among barbarous people? There seems no sufficient evidence to make us lose hope that the remains of the aboriginal Americans may, under more wise and equitable treatment, gradually develop into useful citizens of our republics, and be capable of wholesome assimilation with the body of the population.

It is easy to assert and hard to disprove that the development of the Red race on this continent was progressing slowly prior to 1492. As a matter of fact, we do not possess the

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fruit and nuts. Articulate speech may be supposed to have begun in this status. All existing races of men had passed beyond it at an unknown antiquity.

In the middle status of savagery men had learned how to catch fish and to use fire. My friend Dr. Lumholtz lived many months among the cannibal tribes of Australia, who are in this status. The invention of the bow and arrow marks its close.

The upper status of savagery, in which some of the lowest American tribes still continue, such as the Athabaskans, of Hudson's Bay, and the Fuegians, ends, as above stated, with the invention of pottery. Such tribes as the above know nothing of horticulture, make no pottery, and depend for subsistence entirely on bread-roots, fish, and game. They have little or no village life.

The lower status of barbarism exhibits the domestication of animals other than the dog. In 1492, except in Peru, the dog was the only animal domesticated by any of the aborigines. Indeed, the absence of domesticable animals is pointed out by Fiske as important among the causes which retarded the development of the American Indians. The horse, which is shown by fossil remains to have existed in six or seven species, had become extinct, and was reintroduced by the invaders. The regular employment of tillage with irrigation, and the use of adobe-brick and stone in architecture, marked the end of the lower status of barbarism in America.

The middle status of barbarism was marked in the Eastern Hemisphere by the domestication of other animals than the dog, and there, as well as in the Western Hemisphere, by the development of irrigation in

data, either about their early history or about the primitive condition and rate of development of any of the more civilized races, to permit us to institute a comparison. Our earliest knowledge of the ancient Egyptians, for instance, reveals them living in a state of civilization already advanced at least a full ethnical period beyond that even of the Aztecs. How many centuries had elapsed while the successive stages of savagery and barbarism were passing in Egypt can never be even surmised. There seems no reason to doubt that, had America not yet been discovered, there would have been going on here for the last four hundred years a slow and irregular approach to a higher social condition. There certainly is no doubt that during and since the conquest many sad mistakes, and not a few atrocious crimes, have been perpetrated in the name of civilization and of liberty. But, on the whole, the student of history is forced to admit the enormous ad-

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cultivation, and the use of brick and stone in building, by great improvement in the manufacture of stone implements, and, ultimately, by the introduction of implements of copper or of bronze.

The middle status may be regarded as ending with the discovery of the process of smelting iron ore; and this process becomes more and more important through the upper status of barbarism, and is finally associated with the production of written records by means of a phonetic alphabet or of advanced hieroglyphics.

It is held by those who favor this classification that it renders the scientific comparative study of primitive peoples vastly easier than previously. It assigns definite meanings and boundaries for the terms savagery and barbarism, and should dispel entirely the repugnance with which the latter term has often been sentimentally regarded. It is manifestly impossible to determine in most cases the duration of the several periods above enumerated. It appears clear that certain races have passed through some of the periods more rapidly than others, and that, again, certain races have been more advanced in special points than would accord with the general level of their attainments by which their position in the ethnic scale must be determined. Among the influences which may have affected the more or less rapid development of races the following suggest themselves: The conditions of soil and climate as favoring or not the acquisition of ample and varied means of sustenance; the existence or not of various animals suited for domestication, notably the horse, the sheep, and cattle; the opportunities for contact, by migration, commerce, or war, with races occupying a higher ethnic scale; inherent ethnological defects or advantages in special races.

vantages which have resulted from the conquest by Europeans of the fifteenth and sixteenth centuries of tribes the most advanced of which were still in a very primitive state of civilization.

I have ventured upon this rapid sketch of a familiar subject because it is well that we should be clear in our comprehension of the conditions which existed in America four hundred years ago, when the start was made to introduce the European races and civilizations. We meet here to-day to represent what these have accomplished in their new environment during these four centuries in regard to certain highly important subjects. We cannot fail to be interested in considering what scientific acquisitions in these branches were actually brought here, what disadvantages were to be contended with, how far our progress may be regarded as satisfactory, what great questions there are which concern us all deeply, and in what lines of research and work we may unite for the common good, and for the greater advancement of science.

The words graven on the tomb of Ferdinand Columbus in the cathedral at Seville :* "To Castille and Leon, Columbus gave a New World," are indeed true, but they do not express the whole truth. John Fiske well says: "The discovery of America may be regarded in one sense as a unique event, but it must likewise be regarded as a long and multifarious process. The unique event was the crossing of the Sea of Darkness in 1492, and no ingenuity of argument can take from Columbus and from Spain the glory of an achievement which has, and can have, no parallel in the whole career of mankind. It established a true and permanent contact between the eastern and western halves of our planet, and brought together the two streams of human life that had flowed in separate channels ever since the glacial period." But to demonstrate the magnitude of this discovery, to determine the physical features of this Western Hemisphere, to plant firmly the seeds of European civilization, demanded the heroic exertions of two full

*Á Castilla y á Leon
Nuevo mundo dió Colon.

centuries. Not Spain alone, but Portugal, Italy, France, England, Holland, Denmark, Russia, played their part, and the names of Cabral and Pinzon and Magellan, of Cortes, Balboa, and Pizarro, of Ponce de Leon and Soto, of Champlain and La Salle, of Drake, Hudson, Baffin, Davis, and Bering, must remain associated forever with this stupendous and progressive work of discovery. Not until 1806 was the last step taken by Lewis and Clark, who then succeeded in crossing the continent of North America from east to west, and thus completed the task undertaken by Champlain in 1608. And if the mere study of the outlines and dimensions of America occupied two centuries, what are we to say of the far greater obstacles opposed to the colonization of the vast territory, and to the determination and establishment of suitable forms of government, and of harmonious relations between the numerous States and countries into which America soon came to be divided?

The older political systems of Europe seem to require still the assistance of considerable artificial support, and their occasional disturbances are of a decidedly unpleasant character. Is it strange that some of us still have our little unpleasantnesses at home or with our neighbors, which indicate that the education of our people is as yet wofully imperfect in those things that most nearly concern their welfare? Of this, at least, we may be sure, that all that promotes free intercourse among us helps on mightily the solution of these hard problems. It is a true saying that to know is to excuse, and, more than this, in regard to nations if not strictly in regard to individuals, it may be added that to know is to love. We turn with quickened interest to the sage advice of the illustrious Franklin, who, in 1749, embodied in his plan for the organization of the University of Pennsylvania an earnest advocacy of the thorough teaching of the Spanish and Portuguese tongues as likely to hasten the development of those close reciprocal relations which he foresaw would inevitably arise between the countries of the two Americas. The spirit of the age as it embodies itself in our educational systems and in our literature, the giant forces of steam and electricity, as

they link together the most distant points of our territory, are working inevitably together for the enlightenment, the elevation, the better mutual understanding, and the more cordial relations of all of us.

The year whose four hundredth anniversary we now celebrate found the world stirred as never before. A work of tremendous importance for the future of the human race had been going on amid the gloom of what are often called the Dark Ages. The more closely this period of absorbing interest is studied the more do we appreciate the magnitude and the necessity of the changes effected during those centuries in preparation for the splendid activities of the Renaissance. The mission of the Middle Ages had been really, though not obviously, a cosmopolitan one, and it was fitting that the noblest achievement of the Renaissance should be the discovery of America. The barriers between nations had been lowered, and there had been going on the process of blending and interpenetration which was soon to be extended to this Western Hemisphere with such large results. The protest against mere dogma in religion and in philosophy; the revolt against usurped and abused absolutism; the demand for light and knowledge and the common rights of humanity, these awakened then to be stifled no more, but to swell forever in larger utterance until they shall, in some yet distant golden time, announce universal liberty under equitable laws and universal peace through arbitration. It is not for us to taunt the glowing expectations of the men of 1492 with their long-postponed fulfillment. It ill becomes us of to-day to speak in other than tones of humility when across the brightest spots of the vaunted civilization of the close of the nineteenth century after Christ there still fall so many dark shadows lingering from the deep mediæval night.

How each generation turns aside with the restless impatience of children from the lessons of the past, and shuts its eyes to the truth which inexorable history calmly shows, that long periods of time are required for the accomplishment of each great advance in religious, or political, or social, or scientific truth.

Yet though we smile somewhat sadly as we read the bursts of enthusiasm so plentiful at that time, we dare not challenge the fitness of that grand name, the Renaissance, to the age which, through its mighty discoveries and the master minds who used them, diffused among the nations the new conceptions of the earth and the skies, of the church and the state. Only the pity of it that such long centuries of travail must ensue between this implanting of the seed of religious and political liberty and the mature growth for which we still wait.

In no respect may the discovery of America be regarded as the dividing line between the Middle Ages and the Modern Era more truly than in regard to medical science. In spite of the prodigious learning of the most distinguished Arabian and Jewish physicians, such as Avicenna, the Prince of Physicians, of Albucasis, of Avenzoar, the Wise and Illustrious, of Maimonides, their medical science was far too largely speculative and philosophic. Great universities were established, some of which, as those of Bagdad and of Cordova, possessed regal revenues and magnificent libraries. Numerous hospitals were founded, of which the large and wealthy one established at Cairo in 1283 merits special mention.* But the outcome of this long dominion of the Arabs and the Moors, so far as concerns medical science, was merely a marked advance in chemistry and pharmacy, the introduction of many new remedies, and the advocacy of the union of the natural sciences with medicine. Their chemistry was tinctured strongly with alchemy, their clinical teaching was elementary, their diagnosis and treatment lacked the true Hippocratic force and directness.

The endless speculations and metaphysical discussions of the schools had shown that it was not that way true progress lay. Unaided observation had scarcely gone further in eighteen hundred years than the point to which the immortal Hippo-

* The first hospitals, in our sense of the term, were probably founded about 335 A. D. by Helena, the mother of Constantine, at Constantinople and Jerusalem. That at Antioch was founded in 360, and the famous Basilides Hospital, at Cæserea, in 373.

crates had carried it. True medical science, which could not progress without precise methods and instruments of precision, was forced to wait until from very different quarters came the development of the natural sciences and the era of exact experimentation which alone rendered them possible. Harvey's immortal discovery of the circulation of the blood was not announced until 1616, and his almost equally important and epoch-making discovery of the origin of the higher animals from the egg was published in 1651; yet it may be safely asserted that the work of this modest and truly scientific Englishman did more to advance medicine than all the labors of all the schools from the days of Hippocrates. Not only were the facts demonstrated of infinite importance, but his method of patient, exact observation and experimentation until the truth was developed by cautious induction marks the introduction of a new era, and stamps Harvey as the father of modern medicine.

Galileo first indicated the use of the thermometer in medicine about 1595. Sagredo, of Venice, improved it in 1613, and Sanctorius, in 1625, urged its importance in the study of disease forcibly, but as yet ineffectually, and the last half of the present century is reached before the classic work of Wunderlich placed medical thermometry on an enduring basis of practical value. Just as the astronomer, Galileo, gave us the first rude thermometer, Kepler, another illustrious astronomer, gave, in 1604, the first record of an accurate count of the human pulse. But so slowly did the importance of this datum in the study of disease impress the medical profession that the acute Sydenham, who lived until 1689, nowhere mentions a single pulse count. It is hard to find anything which illustrates better the radical difference between the spirit of mediæval and of modern medicine than the vast mass of obsolete literature upon the pulse, loaded with fanciful speculation and super-refined subtleties of description, and yet wholly deficient in the only features which would give practical value to the study. What progress in exact medicine could be made without chemistry? Yet scarce any development in this branch occurred between the eighth and

seventeenth centuries. And it was Boyle, the father of modern chemistry (not born until 1627—died 1691), who first succeeded in freeing from the trammels of alchemy this noble science. Not until the end of the seventeenth century did the value of quantitative analysis begin to be appreciated. Lastly, it was not until 1590 that we hear of the first compound microscope in the hands of Jansen.

Meanwhile the gross superstitions, combined with a blind dependence on the great authorities of antiquity, and especially on Aristotle and Galen, which had so long dominated medical science, yielded slowly to the growing light of positive knowledge. Fine-spun subtleties, drawn from metaphysical speculation; the fantastic notions of alchemy and astrology; the rank growth of impostures which flourished in the soil of ignorance, and the bigotry which placed every organ under the charge of a special saint and conjoined with every remedy a special form of supplication, still marked medical teaching and medical practice. But the bold, fearless, investigating spirit of the sixteenth century did its work for medicine as it did for other great matters. Vesalius (1514–1564) and his cotemporaries created accurate anatomy. Paré (1509–1590) stamped imperishably on surgery the influence of his genius and lofty character. Paracelsus (1493–1541) hurled the shafts of ridicule and invective against the groveling subserviency to ancient authority, and did a rough but important stroke of work toward the emancipation of the medical mind. The grand old Hippocratic method of careful observation and cautious reasoning was reasserted, the unproductive philosophy of Galen and his Arabian worshipers was discarded, and at last there begins to emerge from the darkness of so many centuries modern medicine, the medicine of loyalty to Nature and revolt against mere human authority; of reverent skepticism and reasonable faith; the medicine of scientific experimentation and of humane vivisection, that insists upon knowing the causes of disease and that looks to Hygiene as its noblest expression.

The history of European medicine for more than three hundred years is a record of which we may well be proud,

when the enormous obstacles to progress are held in view. It is not necessary to remind this audience of a single one of its great triumphs. Vesalius and Paré, Harvey and Sydenham, connect themselves with Bichat and Laennec, and Hunter and Jenner, and Pasteur and Lister, and Virchow and Koch, and the torch of genius is passed down the line of these immortals and lights up the ages with the splendor of their achievements. But it is sad to reflect upon what has been done as contrasted with what might have been. The dense ignorance of rulers and masses on scientific questions, the slow progress of sound, useful education among the people, the huge claims of imperialism and of militarism, the wanton waste of luxury, have retarded research, have left but paltry sums available for the diffusion of knowledge, have hindered the embodiment in legislation and in actuality of much that would help the healing of the nations. It is an odd commentary on the vaunted civilization of to-day to contrast the sums doled out by the most enlightened governments of Europe for the promotion of higher education and original research or for the suppression of preventable diseases, with those lavished on the vast hosts of armed men and the huge fleets of unwieldy armored ships deemed necessary for the maintenance of peace and order.

Within our own day we have seen the announcement of the grandest generalization reached by the human mind, in this century at least, and advanced in the most philosophic and inoffensive manner, received with a burst of intellectual skepticism and of religious intolerance, which showed that the old forces against which the Renaissance protested, and still protests, are yet alive, though happily shorn of most of their power. The marvelously rapid spread of the illuminating doctrines of Darwin, and their incorporation in the thought and speech of the world, and in the teachings of the churches, may indeed be pointed to as the crowning intellectual achievement of the nineteenth century.*

*The grave of Harvey, in Hempstead Church, bears a plate which gives his birth April 1st, 1578; his death June 3d, 1657. His immortal work, "Exercitatio Anatomica de Motu Cordis et Sanguinis," was

If the actual progress of medical science was slow in Europe during the years which followed that *annus mirabilis*, 1492, surely no word of reproach may be uttered against the early settlers in North and South America, because, amidst their heroic efforts to conquer this vast continent, it was long before they found time or energy to devote to the cultivation of that practical and essential subject of medical science.* It is true that in 1551 Charles V. founded the University of Lima, in Peru, and in 1553 the University of Mexico. Yet it does not appear that medicine was taught at these universities until a little prior to 1700.†

In North America, although Harvard College was founded in 1636, the title of university seems to have first been applied to the University of Pennsylvania, which in 1765 established the first school of medicine in the United States. The scattered handfuls of early settlers on our shores had, indeed, problems facing them more urgent than the promotion of science. They differed as widely in their motives for undertaking the appalling task of conquering and colonizing America, and in their fitness for the work, as they did in their nationalities. Separated widely from the mother countries, hampered very often by unwise and vexatious interference from the home governments, they waged war against the powerful tribes of aborigines who swarmed over the country, and against the no less serious obstacles of untried climatic and political conditions. Bloody

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unable to pass the censorship of the press in England, and appeared, in his fiftieth year, in 1628, at Frankfort-on-the-Main. Although susceptible of easy demonstration, this epoch-making discovery failed for years to influence medical thought or practice. Darwin rests in Westminster Abbey, with the sovereigns, the statesmen, and the warriors of a proud people. The inscription, "Born February 12th, 1809; died April 19th, 1882," is to be taken in connection with the fact that his chief work, "On the Origin of Species," published in 1859, in his fiftieth year, was, during his lifetime, translated into all modern languages, and reached in England itself six editions and seventy-two thousand copies.

*The first printing press in North America is said to have been set up in 1639, in the house of President Dunster, of Harvard College.

† Dr. Billings tells me there is on record a complaint of the want of a cadaver at the University of Mexico to read the lessons of anatomy over.

warfare raged promiscuously, and disease was rife. We have seen that the work of mere preliminary exploration occupied two centuries. The close of the third century found the early struggles approaching a successful ending, only to be followed by violent political changes, not accomplished save by long and costly wars. The English conquest of Canada in 1759–60, the achievement of independence by the United States in 1783, the establishment of the independence of the South American Republics in 1810 and the ensuing twenty years—these are the events from which the future historian will date the Renaissance or the Decadence in America, and to which reference will always be made in estimating our capacity for progress in politics, in literature, in art, and in science.

For a long time it seemed even to friendly critics that the new races which strove for a foothold on American soil were unlikely to thrive as vigorously as in their accustomed habitats, and the impossibility of developing a genuine and lasting American type was freely asserted. To those of us who have considered this point with anxious care the last two decades have brought results that put to rest all apprehension. Whatever may be the future changes in the political organization or relations of the countries composing America, it is a demonstrated fact that the European race in America, which already numbers over one hundred millions, will show no decline in vigor or in energy, in physical or in mental strength. It is not on account of mere bigness in material achievement that we point to the millions who fought in the great civil war; or to the one hundred and seventy thousand miles of railroad in the United States—almost as much as in all the world besides, and the $10,000,000,000 of capital invested, and the army of nine hundred thousand employés; or to that tremendous structure, the Canadian Pacific Railroad; or to the plans now under consideration for developing a continuous railway system for the entire continent, from Montreal or Puget's Sound to Buenos Ayres. It is, even more, as evidences of large imagination, of courageous resolution and dauntless tenacity of purpose, and of enormous power of

physical endurance that we value the enterprises which have subjugated this continent so swiftly and are hastening its commercial consolidation. We may be assured that countries which have shown such sturdy love of independence and resistance to outside interference, which have displayed so much sagacity in adapting their political constitutions to their peculiar conditions, which liberate and enfranchise all who dwell within their limits and afford to all an equal chance of advancement, will work out their destinies to far larger and wiser plans of friendly co-operation than we can now foresee.

Turgot, in his memorable address in the Sorbonne, well declared, "Tous les ages sont enchainés par une suite de causes et d'effets qui lient l'état du monde à tous ceux que l'ont précédé." The discovery of America depended on the operation of causes which can be traced back many centuries. The present condition of our continent, four hundred years later, is the result of the action and reaction of mighty movements which involve every country of the world. Here is the new and probably the last great place of gathering and intermixture of all nations. Here as nowhere else are to be studied with all the aids of exact science the problems of ethnology and sociology.* Here are to be worked out to the

* It was on this account that I was so anxious for the organization of the American Anthropometric Society, which was happily established in 1891. The interaction between functional activity and cerebral development is attested by so many facts, and the methods of examining and recording the exact arrangement and minute structure of the nervous centres are so securely established, that the time seems to have come to begin, upon a broad and systematic basis, the study of the progressive anatomical changes effected in successive generations of individuals subjected to the stimulating and rapidly changing environment presented by our modern life. The full members of this Society engage to direct that a post-mortem examination of the brain shall be permitted. The other members make no such pledge, but all are concerned in the promotion of anthropometric and ethnological research. The scope of the work undertaken by the Society is very broad and profoundly important. It is believed that nowhere else can its investigations be so profitably prosecuted as in America. The organization is, however, essentially international in character. It is difficult to overestimate the value of a large

best advantage the problems concerning the relations of man to his physical environment; and the demonstration that in spite of the apparent magnitude of the powers of nature, and in spite of the admitted influence of climate and physical condition upon the progress of civilization, the powers of man for intellectual and social advancement are incalculably superior.

In all of this work a large share must devolve upon medical men, and fortunately our position in America is one which will enable us to work together with good effect. The high average intelligence of our people will make them prompt to appreciate results of solid utility or scientific value. The enormous wealth, present and prospective, of this continent should readily be diverted more and more bountifully to the promotion of learning and research—if, as may be trusted, we shall strive more and more after peace among ourselves and abroad.

We shall never cease to be proud of our lineage, or to acknowledge the immense debt we owe to Europe. Its languages are ours; its glorious past is part of our heritage; its mighty names in art and philosophy and science are household words with us. Its rapidly advancing civilization incites us to loftier efforts. But the balance between the Old and the New Worlds is being redressed.

All know how the examples of our young and vigorous communities have supplied and fed the infectious principles of

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series of exact portraits of the brain, in its macroscopic and microscopic features, obtained in successive generations during even so short a period as a thousand years. These records will be obtained from members of different races living under similar and under widely different physical conditions; and it is hoped to secure such records from many successive generations of a number of individual families whose intelligent interest in such collective investigations may be sufficiently maintained. The good work of this Society is already actively progressing. The records will be preserved in the strictly fire-proof buildings of the library and of the Wistar Institute of Anatomy and Biology connected with the University of Pennsylvania. Doubtless the medical profession of all America will be prompt to help, from their technical standpoint, the great work in ethnology and archæology upon which all Americanists are now so vigorously entering.

political liberty and of social equality.* In every struggle for the rights of man, from the terrible but beneficent drama of the French Revolution down to the present hour, our example and our assistance have been invoked.

I cannot detain you by an enumeration of the services already rendered by America to medical science. Almost immediately after the Discovery important contributions to pharmacology were announced, chiefly from South America, and from the introduction of guaiacum, in 1503, until now these contributions have become more and more frequent. The entire medical world was agitated during the latter half of the seventeenth century by the struggle over the merits of cinchona bark,† introduced into Europe, in 1640, by Juan del Vego, and no more convincing tribute can be adduced as to the value of medical and sanitary science than the prominent place occupied by malarial diseases in the general and medical literature of the seventeenth and eighteenth centuries as contrasted with the feeling of impunity with which they are now regarded. Among the results which may be anticipated from this meeting is, I trust, the adoption of some well-considered plan for systematic conjoint study of our American remedies and their pharmaceutical preparations, looking to their scientific classification, to greater uniformity in their preparation, and ultimately to a single pharmacopœia for the entire continent.

The introduction of nitrous oxide (1844) and of ether (1846) into medical practice, with which the names of Wells and of Morton are so honorably connected; the establishment of the operation of ovariotomy by McDowell, of Kentucky, upon a

* This is the only infectious principle we have communicated. The fable which assigned an American origin for European syphilis has been refuted by conclusive evidence from many sources.

† The motives influencing its opponents were borrowed in part from the doctrine of qualities of the ancients, in part from the hatred of the Jesuits, who were especially active in extending the use of the drug, and in part, as malicious tradition asserts, from the fear that it would cure so speedily as to render the earnings of physicians precarious. One is reminded of the old Indian proverb: "Various are the desires of men; the wagoner longs for wood, the doctor for diseases."

secure scientific basis—these and hundreds of other achievements of lesser brilliance are too familiar to need mention. Every one knows now how superfluous it is to say a word in defense of American literature, and certainly we who know how powerfully the opinions and practice of medical men in Europe and throughout the world are influenced by American writings may view our position with some complacency. Yet a survey of what America is actually contributing to medical literature shows clearly how far we are behind the nations which lead in medical thought. In the year 1879 Rupprecht's Bibliotheca* gave as the total number of new medical books, excluding pamphlets, periodicals, and transactions, 419, divided as follows, viz.: France, 187; Germany, 110; England, 43; Italy, 32; United States, 21; all others, 26; and for 1891 I find the same Bibliotheca gives the total number as 1063, divided as follows, viz.: Germany, 360; France, 243; Great Britain, 141; United States, 80; Italy, 78; Austro-Hungary, 70; Spain, 24; other countries (chiefly Switzerland and Denmark), 67.

On the other hand, in the more ephemeral forms of medical literature the figures are very different. I have had a careful count made of the volumes of medical journals and transactions filed in the library of the Army Medical Museum at Washington with their respective places of publication,† and from this it is clear that of these classes of medical literature there were in 1890 and in 1891 published in America (including Canada, the United States, and Latin-America) about twice as many volumes as in Germany or France, and fully three times as many as in Great Britain.

* J. S. Billings, M. D., "Our Medical Literature." Address before the International Medical Congress, 1881. He adds that these figures are too small, and especially so as regards Great Britain and the United States.

† It gives me pleasure to acknowledge the assistance rendered in the preparation of these interesting statistics by the National Bureau of Medical Bibliography. This admirable enterprise, established at Washington so as to have immediate access to the great library of the Surgeon-General's Office, merits the appreciative support of the profession.

	Totals. 1890-1891.	America, including Canada, United States, and Latin America. 1890-1891.	Germany. 1890-1891.	France. 1890-1891.	Great Britain and Dependencies, not including Canada. 1890-1891.	Italy. 1890-1891.	Spain. 1890-1891.	Austro-Hungary. 1890-1891.	Belgium. 1890-1891.	Other Countries. 1890-1891.
Number of volumes of journals	985, 1021	278, 297	159, 168	153, 160	81, 87	106, 103	36, 37	39, 38	23, 21	110, 110
Number of volumes of transactions	319, 300	104, 84	48, 48	35, 38	36, 33	27, 27	1, 1	4, 6	10, 10	54, 52

Of course we must not forget the fact that in the hurry of our life of to-day many observations and investigations of great value are published in journals, instead of being reserved to become part of more serious and complete volumes. But it will not be doubted, I think, that the great excess of medical journals in America, as contrasted with the comparatively small number of new medical works, is entirely consistent with the admitted leadership of Germany, France, and Great Britain in medical science. The fact that during the past twelve years Germany has risen from a place in this list second to France, 110 as against 187 in 1879, to the first place at present, with 360 new medical works in 1891 as against 243 published in France, speaks eloquently of the strenuous effort with which newly-united Germany is straining forward in science as in other fields. The truth is that the apparently extraordinary number of medical journals in America is due chiefly to a substantial reason, and one which influences equally the existence of very numerous medical schools and medical societies. The vast extent of territory, and the relatively sparse population render it impossible to serve the country with as low an average of medical men, schools, societies, or journals as is possible in more densely-populated countries. As to other and less satisfactory reasons which have operated, especially in the United States, to produce a great growth of ill-equipped medical schools and of poorly-supported medical journals it is not necessary to speak here. Indeed, the rapid rise in the standard of scientific requirements, both of medical men and medical literature, and the increasing appreciation on all sides of the fact that the higher medical education is the true interest both of the profession and of the public is accomplishing the much-needed work of checking the ill-considered establishment of new medical enterprises, and of stimulating those in existence to more earnest life and more lofty aims. So true is this in regard to our medical journals in particular that no one who has occasion to consult regularly the files of any number of them can fail to have been struck forcibly with the steady and decided improvement in the tone of their management and in the scientific quality of their contents.

This Congress meets at a period of peculiar and critical interest in medical education, and I am glad to say that for the first time in the medical history of the United States we may feel proud to have such a meeting convened here, and to invite a close examination of our educational standards and facilities. I should fail in courtesy and in candor alike were I not to acknowledge the great value of the example which has been so consistently set by Latin-America and by Canada in the maintenance of a high standard of qualifications for medical practitioners.

Fifteen years ago the medical profession of the United States arraigned severely the management of their over-numerous medical schools.* While Canada then exacted a reasonably strict entrance examination and a course of medical study extending over four years, with one session of six months in each year, and while every country in Latin-America exacted a collegiate degree or a rigid entrance examination, and a course of medical study extending over six years, it was the general custom with the medical schools of the United States to grant a diploma conveying the full right to practice medicine to applicants who had been admitted without preliminary examination, and had attended without term examinations two courses of lectures covering about five months, and had passed a single and final examination conducted by their own teachers, whose emoluments were derived solely from the fees of such students. This discreditable prostitution of a great educational trust had been gradually brought about by large causes upon which I may not now comment. But it is with justifiable pride that we may point to the admirable and sweeping reforms that have since been instituted. It remains true that the laws of many of the States allow charters for medical schools to be secured without any guarantee of the standard of education that shall be maintained. But the awakened sentiment of the profession and of the community has in a rapidly increasing number of the States insisted that medical graduates before being admitted to

* Regular schools, 65; Homœopathic, 11; Eclectic, 4; total, 80, in 1877.

practice shall pass a State examination conducted by an impartial board of examiners appointed by the Governor. The medical schools, to their honor be it proclaimed, have, with few exceptions, been foremost in the struggle to secure this wise and beneficent legislation. They have done much more. In advance of these laws which will ensure a far higher standard of medical qualifications in the States fortunate enough to be so protected, the faculties of a number of the leading schools have forced their standard up at first to three years of obligatory study, and now to four years of eight months' study each, with a carefully graded curriculum and with strict examinations before entrance, at the close of each term, and finally before graduation.

When we recall that this has been done without the slightest governmental aid, and, further, that owing to the prevalent view that medical schools have been sources of large profit to their faculties the streams of private benefaction had not yet been directed in their favor, you will appreciate the high sense of duty and the devotion to science which have led these faculties to assume greatly increased labors with an expectation of considerably diminished remuneration owing to reduced attendance of students and to augmented expenditures.

The Committee of Arrangements of this Congress has wisely provided for a tour of inspection of some of these institutions. It is trusted that all of our foreign delegates, and as many as possible of the members of this Congress, will avail themselves of this opportunity to examine the equipment of some of our leading medical schools. They will be gratified to find, in hospitals, in laboratories, and in libraries and museums alike, facilities which bear comparison with those of Europe. They will find an arrangement of studies, and, above all, an organization for the conduct of daily thorough bedside instruction in all branches of medicine, which leave little to be desired. It is easy to foresee, as another of the desirable results of such meetings as this held successively in various parts of America, such increased acquaintance with and confidence in our respective methods of medical education and medical treatment

as will retain on our continent many of our students and many of our invalids who have been in the habit of going farther to fare no better.

A broad field opens before us for the study, with the aid of collective investigation, of the distribution and course of phthisis and rheumatism and other important diseases as influenced by race and locality. The endemic fevers, other than malarial and typhoid and yellow fever, which are said to prevail in various parts of North and South America, have long demanded systematic investigation to complete the study which the illustrious Drake began. We shall now have the opportunity of studying, equally by means of collective investigation, the relative effects of various climates on the numerous races now represented in America, and of determining more accurately the scientific and practical questions connected with our extensive series of health resorts which embrace the finest examples of every type. There are, indeed, none of the sections provided for in this Congress from whose work more valuable results should follow than from those on medical pedagogies, on hygiene and climatology, and on quarantine. It was a sense of the urgent importance of these latter subjects, especially at the present time, and of the valuable results sure to follow their consideration by such a body as this, which led the Government of the United States to extend the cordial invitation which has been uniformly accepted on the part of the Pan-American Governments. I feel that by this action there has been secured for the subject of Hygiene and State Preventive Medicine a formal recognition never before accorded on this continent, and one which must surely be followed by the willingness of the respective governments to use their influence to secure the enactment and efficient administration of proper legislation in accordance with the recommendations of this body of eminent experts.

When the International Medical Congress met in Philadelphia in 1876, the address on Hygiene and Preventive Medicine, delivered by the distinguished Bowditch, himself a pioneer in sanitary science, was one of the most impressive utterances on that important occasion. The review there given of the

work of the previous century in this country in sanitary science was not flattering, but with the fine enthusiasm which marked that gifted man he predicted the immediate opening of the grandest epoch yet seen in the history of medicine. His closing appeal must be quoted: "Our PRESENT DUTY is organization, National, State, municipal, and village. From the highest place in the national council down to the smallest village board of health we need organization. With these organizations we can study and often prevent disease." These stirring words were in accord with the spirit of the times and with the developments of science. When the brilliant discoveries of Koch brought to light the specific bacillus of tuberculosis and of cholera, and pointed out the scientific method to be pursued in similar investigations in the future, an unanswerable argument was provided against skepticism or indifferentism or official penuriousness. It required courage and showed rare breadth of view in Lord Palmerston to issue his celebrated reply to the Presbytery of Edinburgh on the occasion of the threatened outbreak of cholera in 1853, in which he urged that the weal or woe of mankind so far depends upon the observance or neglect of the natural laws by which the affairs of the world are regulated, that if the local causes of disease were not removed before the return of the hot weather, the pestilence would be sure to return in spite of all the prayers and fastings of a united but inactive nation.

Much was accomplished, it is true, in preventive medicine between 1853 and 1876, when Bowditch spoke; but it is scarcely an exaggeration to say that the progress in the past twenty years has been greater than in the preceding twenty centuries. We have not, indeed, yet detected the specific poison of every infectious disease; even in regard to the familiar and much studied yellow fever, the latest publication of the distinguished Surgeon-General of the United States Army shows that this point is still unsettled. But the position of the whole matter is changed radically. Hypotheses have given way to facts. Every one now knows, or ought to know, that the most dreadful diseases are inseparably

connected with definite organisms, that these organisms have special laws of development and distribution, that to destroy or exclude them is to avoid the disease, and that to tolerate conditions which favor their development is to encourage and invite the attack of the disease. When these simple, demonstrable propositions are considered in connection with such scourges as cholera and yellow fever, and typhus and typhoid fever, and scarlatina and diphtheria, and epidemic meningitis, it needs no further argument to prove the value and the necessity of quarantine, and of efficient medical inspection and protection. Nor does it need further argument to show the wisdom of establishing laboratories of hygiene at many points over the country, of equipping them amply with the ablest men and the finest apparatus, and of endowing them liberally, so that the search after the yet unknown causes of disease, and after the best methods to prevent the development of such causes as are known, may be prosecuted with ceaseless vigor.

It is easy now to get a hearing for these views, when public comfort is disturbed, the public purse threatened, and the public conscience awake and sensitive. At this moment our great commercial communities are reposing in confidence upon the sanitary measures adopted by our governments, in accordance with medical advice, for the restriction and exclusion of two dreaded pestilences, cholera and yellow fever. Recall with me the popular terror of last summer. Recall the hideous loss of life and the disastrous effects on commerce caused by former invasions of these diseases when the communities afflicted were smaller and less wealthy than are ours at present. We do not have to seek back to the Middle Ages for pictures of desolation wrought by infectious disease. Recall that tragic story of the great yellow fever epidemic in Philadelphia just one hundred years ago, as told by Rush. Try to estimate the result if cholera had effected a lodgment in New York City in July, 1892, and having found favoring local and climatic conditions, had, as on former occasions, spread its deadly germs to the North and South and West. The fair White City that was rising by that distant lake, under

the magic wands of Art and Industry, would have been stricken with a fatal blow. No computation can well exceed the loss that would have fallen on this country. The entire people gazed with bated breath at the struggle waging in New York Harbor, and universal thanksgiving arose when the dread invader was finally repulsed by the vigorous and sustained efforts of the sanitary authorities. That we in America are not to-day witnessing the aggravated recurrence of the epidemic, in accordance with unvarying precedent, can be due only to the continuance of these same efforts, reinforced with large authority, and aided by more efficient local sanitation. When this gratifying result is associated with the success which for some years has attended our efforts for the exclusion of yellow fever, no further argument can be needed to urge the adoption of such uniform measures as will for the future afford most sure protection against these diseases. These instances exhibit in the most striking manner the need and the value of the international sanitary agreements this Congress may do much to promote. But there will occur to all of us many other important questions to be solved only by earnest and united work. Nor can this work be accomplished until Bowditch's cry for organization is far more fully answered than it yet has been. Nothing but organization and co-operation, and, yet more, the establishment in the government of every civilized nation of a department of public health, will secure the continuous and forcible attention which the magnitude of this enterprise demands. There should be, and the day cannot be far distant when there shall be, in the cabinet of every government here represented a Secretary of public health, of rank, influence, and prerogative equal to that of any other cabinet officer.

Here, then, is the last and greatest service to be rendered to science and to the nation by our Congress. Our combined influence will be irresistible when used in advocacy of higher education; in carrying out large plans for the scientific study of our national life, as affected by social and climatic influences; in the adoption of remedies and remedial measures of demonstrated merit, and in the insistance upon a fuller

recognition of the lofty function of preventive medicine. "Salus Sanitasque Reipublicæ, suprema lex." Let us acquire here a closer touch with each other, a deeper faith in our profession and its noble destiny, and a stronger determination to labor in brotherly co-operation for the loftiest ideals of service to science and the race.

It would be improper to omit an acknowledgment of the free use that has been made in the preparation of this address of various authorities. Especially must be mentioned Fiske's Discovery of America; Baas's History of Medicine (translated by Handerson, 1889); The Discovery of North America, by Henry Harrisse (Paris and London, 1892); The History of the New World, called America, by E. T. Payne (vol. 1, Oxford, 1892); Buckle's History of Civilization in England; Draper's History of the Intellectual Development of Europe; Fisher's Outlines of Universal History; The Early History of Instrumental Precision in Medicine, by S. Weir Mitchell, M. D.; Historia Bibliográphica de la Medicine Española, by A. H. Morejon; Publications and Unpublished Letters of Dr. Daniel G. Brinton; Report on the Etiology and Prevention of Yellow Fever, by George M. Sternberg, 1890 (now Surgeon-General U. S. A.); Lubbock's Origin of Civilization, and also Prehistoric Times; Tylor's Anthropology, and also, Researches into the Early History of Mankind; Lewis Morgan, Ancient Society, New York, 1877.

It gives me much pleasure to acknowledge also the assistance received from Dr. R. P. Robins, especially in the examination of the History of Early Spanish Medicine.