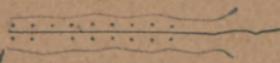


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IN RELATION TO

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A SOCIALISTIC STUDY.

By FRANK S. BILLINGS, M.D.

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ORIGINAL RESEARCH IN ITS RELATION TO NATIONAL ECONOMICS.¹

By FRANK S. BILLINGS, M.D.

A PAPER on original research would not be "original" unless treated in the same manner. To properly discuss such a question is not the simple task that many might be inclined to think it. The majority would probably assume that all one has to do is to define original research, and then detail and criticize the various methods of investigation. Such a plan would not, however, explain the most important point which we have to consider in discussing original research in this country, which is the very obvious fact that it has never received either governmental support or appreciation among any peoples of Anglo-Saxon descent, or such as have received or drawn their primary ideas of government and its duties and obligations from a British model.

Let me at once say that my view of looking at all social questions is entirely scientific. In all these matters it has been my endeavor to force sentiment of every kind or nature entirely into the background as much as possible. People do not understand the physiological value of sentiment, which is not to cause direct action on the part of the individual, but rather to call the attention of the reflective powers to certain phenomena, which should lead to action or not, according as sound judgment indicates; or, in

¹ Read by title before the Missouri Valley Medical Association at its late meeting at Louisville, Ky., on account of unavoidable absence of the author. Also read before the recently organized Chicago Academy of Medicine.

other words, *sentiment may be defined as the excitation of a fore-center in the brain by which to call reflection into action.* Human development is the greatest of all natural experiments, because of the possibility, mostly future, of mankind devoting some of its own energies to it. To me, country means nothing more than that a portion of our race has been confined to one locality by natural limitations. Nationality is a semi-farce dependent on an accidental or unwished-for conception following lust, and resulting in a birth which happens anywhere the mother may happen to be at the time of the birth of the child. The artificial limitations of race, nationality, or patriotism are barriers in the way of human progress. The masses are so much crude material which the scientific psychologist should see what he can do with to render it capable of avoiding the miseries due to their own ignorance. I do not believe in the "brotherhood of man" idea, but rather in that egoism which would remove miseries as a disease which may react on one's self, or those through whom one might suffer. Hence, it is for self-protection and self-benefit on the part of every intelligent person that original research should be inaugurated and supported by every people.

Now, as to why original research has not received proper recognition by the Anglo-Saxon race and the support of its governments? *Because, this race is the best example of the extreme development of the individualistic principle among the peoples of the world.* While in certain practical directions the Anglo-Saxons have advanced equally with and perhaps more than any other race, still their ruling principle has been "every man for himself, and the devil take the hindmost," which principle is very liable to give this country a period of satanic ruling unless checked very suddenly. The governments of Great

Britain and the United States both deal with the people as if the latter were so superhumanly intelligent as to know enough to govern themselves and do for themselves, as a whole, that which is best; in other words, government in these two countries is of the "let alone" policy to the most unintelligent degree. The intelligence of the country, as represented in the government, has not yet comprehended the fact that "that which is every one's business is no one's business," nor that the government has some higher duties than imposing taxes and creating artificial difficulties and barriers between peoples. No matter what form a government may have, its only duty is to study all the interests of the people. Individualism is individuality run to aggressiveness towards every one else. It is the result of the law of the "survival of the fittest" exemplified in *optima forma*. It holds unlimited sway in Great Britain and this country.

But there is another factor of still greater importance in the development of our race, which is Socialism, by which we mean the mass, or the whole as opposed to the aggressive or strong in it. The rights or welfare of the masses collectively have never received any consideration in either of the countries mentioned. Government in both is in the hands of one class, though to a greater degree in this country than in Great Britain. It is really to this fact that the failure is due to appreciate the value of original research and the support of the highest scientific education by Anglo-Saxon governments and peoples.

A statement which may at first seem preposterous to the majority is, that in the light of existing facts in social science the so-called "freest governments" all tend to the support of an inconsiderate and despotically aggressive individualism, while the most advanced monarchies, Germany in particular, not only have checked it, and though in one sense more indi-

vidualistic in theory, still they more fully recognize Socialism as the chief factor to be considered in political science. In other words, these governments rule on the principle that that which is essential to the welfare of the whole people must of necessity be of equal value to each individual among the people.

Where governments have recognized socialism as the chief factor in politico-social science, original research has been supported, and has proved of inestimable value to the people. Where governments have not recognized socialism as such a factor, and have advanced individualism to the most exorbitant development at the expense of the masses, original investigation and the highest scientific education have received neither recognition or support, to the great and continued injury and disadvantage of the people as a whole.

Let us look at these statements a little more carefully, for it is indeed a singular phenomenon in social science to see the interests of the people carefully studied and means sought to advance them by the best forms of monarchical government, while the more governments have approached republicanism the more we see the interests of the people neglected, true socialism and an inordinate and aggressive individualism permitted to develop.

How few physicians think that the real cause of the non-support of science in countries having the most complete representative governments must be sought in the very factor which has been the claim of such governments to be their peculiar strength!

The truth is this "strength" is their greatest weakness.

When we come to ponder more closely over this matter we shall see why intelligent monarchies, taking Germany as the most striking example, have sought to develop all that could pertain to the benefit of the masses, rather than to allow the strong among

the masses to develop themselves at the cost of the rest of the people.

Let us see again what individualism is. Remember, it is not individuality, but rather individuality developed to aggressiveness on the rights and interests of the whole people.

Every intelligent government, no matter what its form may be, should seek its strength in the general welfare; because, if rightly administered, it must of necessity be a sort of barometer of the national prosperity. Again, an active monarchy is of itself strongly individualistic, and, hence, cannot for its own safety allow the development of either individual or collective aggressiveness. The true secret of a successful monarchy is to make its individuality apparent to all the people, and at the same time keep its individualism so controlled that the people as a whole will not feel that it is aggressive. That is approximately the condition in Germany to-day.

The eyes of the government are on the nation as a whole rather than on individuals in the nation, save to keep the too aggressive ones in check. The government endeavors to do that for the people which they have not time to study or inaugurate for themselves. This is *true socialism*, no matter what form a government may take. On the other hand, representative governments, or limited monarchical representative governments, as seen in this country and England, look to parties for their support, and parties look for their strength to the rich and influential men, whose self-interest impels them to contribute to the parties' demands in days of necessity; hence, those who control money, or have influence, have the ear and attention of the party bosses, in fact, own them, and the laws are made for them, and against the general interests of the masses. In other words, the battle in England and America to-day is between exorbitantly-

developed individualism and a national socialism, while in Germany and on the Continent it is between a mistaken form of socialism, a bastard variety, which has become, or is in danger of becoming, aggressively individualistic, for a party can be too much so as well as a person, and true socialism.

No matter what the form of government may be, when individuals are allowed too full play, when the most aggressive, strongest, and most mercenary minds are allowed full run, it must always be at the cost of the masses, and general or national interests will be neglected, because of the deference politicians, or the ruler, pay to such men. This is just what is occurring and exists in this country and in England to-day. Unusually aggressive and strong men, or those favored by birth, have absorbed the natural resources of these countries, control all public means of transport, and what they have not seen fit to do for themselves has been left undone. There has been no honest, if any, representative of true socialism: the people. Whatever good there is in public institutions of France is due to the effects which true socialism exerted upon the government as a monarchy before the days of the republic, and in so far as the republic has inherited a very strong tendency to watch the interests of the people as a whole, so far is that country ahead of us in national development.

All we have to do is to look at the laboratories of Europe and their public health organizations in comparison with those of this country. All we have to do is to remember that nearly all the prophylactic knowledge which we have has been the result of investigations made in Continental laboratories. But that is not all. Nearly every technical interest in the world has been benefited in the same way; hence, the wealth of the world has been most materially increased. Look at Helmholtz and Du Bois-

Raymond's work in physics; Rokitansky's, Virchow's and others in pathology; Pettenkofer's, Koch's and others in epidemiology; at Pasteur's, Chauveau's and others in that department of preventive medicine, the promises of which will surely be fulfilled in time, and are almost too momentous for human conception. I need not speak of the work of lesser lights, important as it is, in Belgium, Holland, Italy, Austria, distant Hungary, and still more distant Russia. The point I desire to make is, that this work has been of more value to humanity than all the mere money making inventions of man since man began to think, for they all have to do with the preservation and protection of human life.

Another point is, that this work could not have been done except under government auspices, representing the people, and by men so situated that they could devote their entire energies to the interests of the people.

A fact which will not be learned in this country until statesmen of great intelligence and large humanity take the place of the small-brained politicians we have now, is this; *that the very nucleus of national economics is a healthy and prosperous people, and as the people have to attend to their individual affairs, it is the absolute duty of those selected by them to attend to their general affairs, to study all matters liable to have a general application.*

Fools and idiotic editors of a partisan press may assert that such a procedure would be introducing parentalism into our government. Good, if that is so, then let us have the fullest recognition of the principles of true socialism. The trouble has been that we have the very best example of a bad form of parentalism possible in this country; a sort of recognition of the right of primogeniture of a few favored children, at the cost of the welfare of the balance of

the family, the people, until now we are about to face a desperate conflict between a pampered, bloated and protected individualism of manufacturing interests and the desperation of true socialism. The masses against the few. It needs no prophetic mind to see which will eventually win. The scientific question will soon be to keep true socialism, mass-rights, from becoming individualistic, that is, aggressive and unjust.

The fathers of this country did a singular thing. Theoretically they sought to establish a socialism, but so much had they been imposed upon by monarchical individualism that they planted the seeds of even a worst form in the country by placing no restrictions upon moneyed or corporate individualism. They never thought that we should have money kings or interests in this country that would prove more dangerous to the welfare of the people than even George III had been to them.

Now, what has all this to do with original research? Have I not shown you? Have I not shown you that original research severally and in its entirety represents the welfare of the people as a whole, and hence must be supported by the people and conducted intelligently for them by those who should represent their interests?

I am fully aware that this is a rather striking way of presenting this question to your consideration, nevertheless, it seems to me that it is the only true way.

Thus far we have been talking about a subject which very few people know much about, even physicians, and, hence, it is about time that we attempted to define original research.

WHAT IS ORIGINAL RESEARCH?

To completely answer this question we must look upon it from two distinctly different points of view,

viz. : The ultra scientific, and the practical, or in other words, the search for knowledge for knowledge's sake alone, which is the ultra scientific; and second, the search for the best means of applying the knowledge gained to the uses of humanity, which is the practical.

Original research, in the strict sense, is the study of natural phenomena in order to discover their nature and causes, and the laws by which they are produced. Science is the methodical application of acquired knowledge to the acquisition of new facts.

Original research is the search for cause. The spirit which inspires it is as old as humanity, and will keep on increasing in intensity as long as man continues to add to his intelligence. Original research knows no such comforting words as "where ignorance is bliss, 'tis folly to be wise." Its followers are ever irritably aggressive; they neither know nor do they want to know the meaning of content so long as something remains to be known, or until worn-out nature indicates that the time is approaching for "folding the hands in that sleep which knows no waking." Every natural phenomenon has its physical and material cause. Original research being entirely of human origin, and the result of the effect of natural phenomena upon the mind must be of itself a psychical phenomenon. An exact definition of original research is also the only true and logical one of that entirely misunderstood psychical phenomenon, religion. Theologians, and even philosophers, have all failed in defining religion, simply because they have assumed that it was something injected into a person—something supernatural. Not one of them has touched the hem of its garments. There is a natural psychical phenomenon to which the name religion can be given, and the cause which calls it forth is exactly the same as that which produces the desire for original research. Let us see what it was, and is :

True religion, the only religion, is that effect upon the mind, tutored or untutored, produced by natural phenomena of whatever name or nature, which, acting as cause, inspires it to seek cause.

No scientist will deny the logic of that definition, and it will tax the audacious ignorance of the theosophist to deny it.

The effect of such natural phenomena upon the untutored mind, either in the early days of human development, or where found to-day, was and is the production of fetichism, *which is the inspiration by an observer of a selected object with or by a hypothetical cause.* This result of the religious principles might be called "free religion," or better, "free theosophy," to use modern expressionless expressions, in that it allows the inspiring of as many objects by the beholder of natural phenomena as he assumes causes for. Fetichism, again, can be defined as the limitation of cause to a selected object in which the observer assumes it to dwell, while theosophy, or theology, may be defined as the non-limitation of cause to space, which is quite as full of ignorance as the stone block of the fetich-worshipper. *Theosophy is fetich worship without bodily or object limitations.*

Original research knows no such narrow boundaries. In its crudest form it came into the world when the first man sought the cause of any natural phenomenon. It is coëval and identical in character with the psychical phenomenon called religion. Wherever a human mind has sought cause original research has existed. It is not limited by geographical or ethnographical boundaries. It is that great act of the mind which makes and has made man in the only distinctive sense, man. Now, the theologians, in their ignorance, say rightly, when they declare religion to be the great and exclusive characteristic of man. Dare they deny that original research is also? Let

them howl "infidel" if they will, and I will throw it back in their teeth, for does not Job tell them, "Can ye by searching find our God?" And has not the greatest teacher of the spirit of true religion taught them?

"Shall any gazer see with mortal eyes,
Or any searcher know by mortal mind?
Veil after veil will lift, but there must be
Veil upon veil behind."

Who have been the veil lifters? Who but the original investigators, commencing with that unknown one who first, like a true materialist, said "and man was made of the dust of the earth" because he had seen that "like produces like" was a law of nature, but unable to comprehend, and rightly, according to his light, how vitality could be in or of dust, had, in his ignorance, to assume a life-giving, creating spirit, capable of permeating dust? Beginning with this wonder of the sages, the veil lifters come down through the ages each one endeavoring to seek the true nature of natural phenomena; the secreted causes of which always remain largely hidden from the view of the original investigator. Who but they have taught us all we know of the origin and nature of animal life? In the beginning all seemed hidden behind that veil of darkness which theologians have tried to fasten upon the minds of man. How glorious the band of veil lifters in our own especial branch of research! Though we cannot call to mind all of them at this time, let us venerate the memory of a few of the giants among them, beginning with that majesty divine, Aristotle; what a flood of light was shed in behind the corner of the curtain lifted by that son of Grecian culture? So much light did he let into the abyss of intellectual darkness, that even the clouds of the dark ages could not shut out its life-giving rays. The corner dropped

for awhile, to be again lifted by the genius of Hippocrates, Galen, and the veil lifters of the early centuries of the Christian era, though they added but little to the light reflected by the work of the greater master.

For centuries it burned like a vestal-fire upon the altars of knowledge ; sometimes it flickered to a dim spark, but again burst forth under the skilful touch of a Vesalius, sending its warming and dispelling rays into the clouded ignorance of priesthood and sanctuary. For the first time in its history the human form actually became divine, for the son of true inspiration had given the veil a mighty lift. Vesalius let the light in upon human structure, but how the machine worked, what gave it life and action, was still a veiled subject and remained so until another genius touched the already lifted curtain with magic wand, and lo ! the streams began to move, and man was told something of that wonderful current, vital life's mystic energies, the blood, and Harvey inscribed his name upon the uplifted curtain, and physiology was born. And so went on the work. A Hunter took hold of another corner, letting the light into the mysteries of disease and death, and pathology was inaugurated as another branch of original research, to be followed by Boerhaave, Haller, Bichat, Lænnec, Goethe, Muller, and an ever-increasing army of investigators, each of whom lifted the veil somewhat ; each of whom had been inspired by Goethe's immortal words, " Mehr licht." But this lifting of the veil, even in our own branch of research, was somewhat one sided. The other side was still draped in mourning in token of the griefs and sufferings of humanity. Many earnest men had made mighty efforts to stem the tide of the great devastating plagues which impoverished humanity and almost destroyed nations, but the wail of anxious

millions only too pregnantly manifested the futility of their endeavors. But when did man cry in the bitterness of his anguish to his brother man that some one did not rise up to lift the veil and let in the light? So it was this time! The cry of the ages brought forth the immortal Jenner, and the greatest life-saving and misery-preventing principle, the greatest blessing man ever gave to man, was inaugurated, the *prevention of non-current diseases by inoculation*. Now, indeed, the light was great. But the work went on. So much light only made more pregnant the darkness beyond, and this darkness inspired others to work on and seek to lift up still more the veil upon the uplifted folds of which we may read the names of a Rokitansky, a Virchow, a Pettenkofer, a Koch, a Helmholtz, a DuBois Raymond, and a Ludwig, and then, with one mighty throe, comes Pasteur, and what a light do we see? The star of hope lifted above the horizon by Jenner, now shines in glorious radiance in the heavens, and original investigators may safely promise the eventual prevention of every non-recurrent disease of life by inoculation. Then shall mothers bring forth children with hope, and man become monarch of the grave in so far as man can control that grim and natural king, death.

WHAT MAY BE EXPECTED FROM ORIGINAL RESEARCH IN GENERAL.

In our previous remarks it has been our endeavor to show that it is the duty of the government to study the interests of the people in every respect. With the advance of civilization and the increase of population the question of individual prosperity, by which is simply meant the means of acquiring the actual necessities for comfortable living, is becoming more sharply circumscribed, and though the indications of

wealth are constantly increasing, it is becoming more and more centralized in the hands of a few, the whole tendency of government being to throw it in that direction rather than to increase the prosperity of the masses. The acute danger must be apparent of a revolution against this extravagantly developed individualism, which has brought about this condition of things. An intelligent government should see that the rights of the masses have due consideration at once, or else no one can answer for the results when socialism begins aggressively to assert its own individuality. One of the things which will, or can be made to, play an essential rôle in improving the condition of the people is the increase of the reproductive resources of the country in every way possible. The matrix of these resources is Mother Nature, where much is locked up in a crude form, or much refuse material is thrown away, for which uses could be found by the diligent investigation of original researchers carried on at the expense of the people. In this regard one has only to call attention to the increased earning power given to thousands of people, or better, the increased employment of people, through the discoveries of the analine dyes and other chemical substances in coal-tar, which was once a refuse only gotten rid of with difficulty.

It cannot be denied that every new discovery increases the means of employment offered to the people; nor can it be denied that it is the duty of the people themselves to take every means possible to increase these discoveries. It is protection of the public welfare of the truest and highest kind, and, what is grander still, it is not only beneficial to the nation in which such discoveries are made, but equally so to all humanity.

The results of all scientific investigation should be free to the world. Without discussing the matter

further, let it be said that the benefits of all inventions should also be equally free: the inventor to be paid for his discovery in proportion to its value by the judgment of a commission or national department of experts, appointed to decide upon such questions. This is the great difference between inventors and original investigators; the one have immediate financial returns constantly in mind, the other simply the discovery of new facts. Remember this, that although we cannot always see the immediate practical value of the addition of a new fact to the fund of knowledge, still no one can ever tell how much vital importance may be hidden in it. The uneducated and unreflecting would probably question any value to the work of Darwin and the principle of evolution, which has found its full corroboration in the stimulus given to original research by the work of the greatest generalizing naturalist the world has ever produced, and yet the very future of social development, the reorganization of the entire social fabric, and the formation of government on everlasting and logical principles, all depend upon a clear understanding of the principles of life which have followed as the natural result of the work of Charles Darwin. Still, there has never been, and never will be, any "money in it" for the original investigator—past, present, or future.

There is another practical side of this question of original research which needs to be called to the attention of those who know little or nothing about it. Aside from the discoveries which the people have a right to expect will result from it, original research calls for a vast deal of mechanical ingenuity and the invention of instruments of all kinds and shapes and material, not to speak of its demands upon chemistry and nearly every branch of research, so far as especial lines of investigation are concerned. All this creates a demand for labor, and increases constantly new

calls upon the wage-earners, the value of which is inestimable. Take, for example, that branch of investigation which is looked upon with the most suspicion by professionals and by the laity, patho-biology. Leaving out of consideration entirely the question as to the practical value of the results of this variety of research, which, by the way, is infinitely greater than is generally admitted, the amount of new work created, the calls for labor in building laboratories, the increased demands for a very high class of mechanics in the manufacture of the high power microscopes, the continual demand for new instruments according to the peculiar ideas of workers in their endeavors to solve new or intricate problems, the demands on chemistry and other results of research have in themselves given labor to so many people in so many lines that even had a single practical fact not been established, the endeavor to discover it has brought more benefit to humanity at large, tenfold over, than the entire expense of the work itself. Whatever provides labor enough to keep one human being alive and free from misery, is to be counted as a blessing to humanity. And so, an idea which stimulates research and calls for investigation to prove or disprove it, if it calls into existence only labor enough for one man, is worth so much to the world. So much for original research in general.

Those who desire to pile up the actual facts of value it has contributed in all its branches to the world, certainly have their hands full. Such testimony in statistical form would be most instructive matter to present at once to the active consideration of the governments of the world, and is nowhere more needed than in this country of a stupid and ignorant press and unintelligent legislators.

ORIGINAL RESEARCH IN ITS RELATION TO PUBLIC HEALTH.

How many of you think that the two great social factors—individualism and socialism—have played the essential rôle in the investigation and development of this, the most important branch in the study of medicine in its relation to national or human welfare? You doubt it? Let us see. Socialism, in the form of national individualism, has been the primary factor in all the great wars of Europe during the past century. Human ambition—individualism—on the part of a king or ruler, may have been the exciting factor; but had he not had patriotism—socialism become individualistic, the people as one—to depend upon, no war would have resulted. Whether, for good or bad, the touch between the people and their ruler is much closer in monarchies than in republics, because the solidity of the government and the welfare of the ruler are far more dependent upon the welfare of the people in a monarchical form of government than in the transitoriness of position common to those upon whom government devolves in republics. I have heard a story with regard to that master of sarcasm, the poet Heine, the truth of which I cannot answer for; but it beautifully illustrates the point I desire to make. It is said that when once asked what was the economical political relation of the working classes of Germany to the government, Heine answered, "Fornicate, fornicate, fornicate, and see to it that you make plenty of food for French cannon." The same might be equally said of all the other nations of Europe, and it is the complaint of France to-day that her people are not doing all they can to supply the necessary quantity of this kind of food to feed the ravenous appetites of German cannon. Looked at from one side of the story, such an idea seems barbarously inhuman;

looked at from other sides, it has many advantages. Though no follower of Malthusianism, it is easy to be seen that the smaller the number of children the greater the comforts of the parents and their ability to take care of them. But that is not the point of value in the discussion. Where every male represents a factor in the integrity of the nation, his health and prosperity, as well as that of every family, must, of necessity, have a direct value in the consideration of the government; and it is this very fact, the fact that the interests of the people as a whole—socialism—have been the stimulus that has led to the support and development in Europe of original research, not only in matters pertaining to the public health, but national prosperity as well; and we find this development the most extensive in those nations between which the national rivalry is the most intense—France and Germany—where each man counts the most as a national defender and supporter, and less developed in proportion as this one great factor does not come into active prominence; but nowhere is it neglected entirely except in those nations where people do not come into consideration in this way, or where the prosperity or better existence of the government does not actually depend upon the condition of the people individually and collectively as in Great Britain to a large degree, and in this country to such a great degree that it scarcely comes into account at all.

Having adopted this principle, having seen its practical value in every direction, the governments of Europe have laid a wise and solid foundation for the coming day of "Peace on earth and good will to man," when international socialism shall have triumphed over national individualism, through the ever-augmenting results of commercial intercourse, until the business relations between people shall have

become so just and of such vast financial importance that no nation will dare disturb them, and the swords shall be welded into plough-shears and the metals molded into life-saving, instead of destroying, instruments. Money must first become such a king that national individualism cannot dethrone it, and then shall come the day when international and intra-national socialism shall rule in the spirit of justice between men and nations. Then the highest intelligence will be appreciated, and the original investigators in every department of research will be esteemed as the greatest men in the world—the evolvers of knowledge, the founders of national and human prosperity.

The answer which will probably be made to the portrayed condition of original research in this country and Great Britain, in comparison to Europe, is: "Oh! those are parental governments!" No one but an ignorant fool could possibly make such an answer. No government exists, or has ever existed, save at the will of the people. When socialism has been fully aroused, the people—the most individualistic governments the world has ever known—have either yielded their aggressive individualism to the demands of socialism, or have been crushed, even though another individualistic government has been suffered to take the place of the first, simply because of the incompetency of the people to assume the reins of government; but in each one of these convulsions—socialism—the people have gained something, and individualism lost. We are now on the verge of the first struggle in which socialism will come out triumphant, and the human race begin its age of most wonderful development if socialism has intelligence enough to trust to the greatest intelligence of the nation; but if it allows itself to be broken up into socialistic-individualisms (communes or parties), with

all the evils of the moneyed individualism of to-day, then the future of humanity will be one of international and local social suicide.

All governments, whether created by the people or existing by sufferance of the people, being still of the people, who, then, can deny that a nominal or theoretical socialism like the United States, a government of the people, for the people, by persons selected to represent the people, should not be more intensely interested in all that pertains to the welfare of the people than one which exists merely by the sufferance of the people, as a monarchy? The real question is, Have the people, socialism, intelligence enough to comprehend the importance of this fact? Thus far in its history they have not had. What is every one's business has found no one to undertake it in this country to its fullest extent, and in Britain to a less degree. But we are learning by bitter experience that there are common and general interests of the people which must receive the most intelligent attention on the part of those selected to attend to all such matters; and among these things—the public health is the most important.

What other disaster can exert so widespread and profound a disturbance of the individual, communal, and national welfare as the prevalence of some devastating plague, such as Asiatic cholera or the yellow fever? The business community of all kinds can testify to the acuteness with which it feels the existence of even a very limited outbreak of the yellow fever in one of the Southern States. The whole country suffers in barometrical-financial sympathy with the afflicted part. When the eruption is as extensive as that which afflicted Memphis in 1878, the financial barometer sinks to a very low degree in all parts of the country. Not only does the financial barometer fall, but the social one is in such intimate

relation with it, that a cloud settles on the families of the land in silent sympathy. Not only this, but the families broken up, the widows, the fatherless and the motherless, in the afflicted localities, have given bitter testimony that humanity owes to itself the duty of protecting itself from such ravaging pests. But we need not call up such extensive disasters to establish our principle that the health of a nation is the very nucleus and foundation of its prosperity. Local outbreaks of scarlet fever, diphtheria, or typhus not only cause serious effects in the locality afflicted, but even extend to unknown distances, causing disturbances of a financial character. Even the death of the head of a large business, a single person, is felt as much by those having business relations with him as by his immediate family, and financially sometimes more so, when a large business, employing many persons, is closed up in consequence thereof. We can leave all sentiment entirely out of consideration and truly say that the financial disturbances caused by the death of mature individuals, and the actual suffering due to financial influences alone upon families from the diseases which it is in the power of original research to discover means to prevent, is greater than the disturbances caused by the occasional outbreak of such a pest as Asiatic cholera. The trouble is that we do not stop to think of these every-day occurrences in our busy, rushing lives. Let national statistics once show what the sum total of the financial disturbances from such diseases is, and the whole world would open its eyes in blank amazement. Mind you, we say from diseases which it is in the power of original research to eventually bring very close to a condition of actual prevention.

Now, let us turn to the sentimental side: Practically speaking, the life of a child is worth nothing; sentimentally, it is worth everything. Sentiment-

ally, even beyond the saving of the life, the possible power of saving our loved ones from the tortures of disease and the life-long misery often consequent to it, especially that incarnation of satanic deviltry, scarlet fever, is worthy of the life-long endeavors of hundreds of original investigators and the accumulated treasures of any people. What true father, what fond and noble mother, even though a thousand times a millionaire, would not willingly sacrifice every cent to save a beloved child from the terrors of scarlet fever, and be willing to begin life's work over again to have the dear one alive or free from the too frequent results of that disease? This can be done. Every non-recurrent disease of life is as absolutely certain of eventual prevention by means of original research as that nature herself has indicated the fact by the non-recurrent character of the disease. Let us look at the list to which nature has given us this key. First in importance, scarlet fever, then yellow fever, typhoid fever, measles, mumps, whooping-cough and chicken-pox; not to speak of small-pox, over which the victory has been won, and the grave robbed of thousands of premature victims. We need scarcely speak of what has been done through the sharp practical observations of men in past ages, and even the present times. The black death and bubo pest have been banished from Europe; Asiatic cholera has become a wild beast well tamed. The yellow fever is now kept well confined to its native haunts; but still the greater victory of preventive inoculation remains to be won over many of these diseases by original research.

Let us look at another side of the story.

The first great nucleus, the keystone of national economics, is the public health. "Public health is public wealth," has become an axiomatically accepted expression. Next in importance are the strictly agri-

cultural products of the country, all of which can be benefited and increased, and all of which also can be preserved from many dangerous diseases or enemies, through the results of original research. Then comes our animal wealth, which suffers a financial injury of not less than one hundred millions annually from preventable diseases, of which swine plague represents not less than thirty millions, and other diseases the balance. But, beyond this financial loss to the producer, we must consider the still more important loss to the people of the country, when such a vast amount of food, which, taken in connection with the loss in our strict agricultural products, means an amount of food capable of supporting a population again as dense as that which we now have.

We are a fortunate people that we can bear such losses; but we feel them in the increased cost of living, though no one stops a moment to think how it comes about. Much work that has already been done, the incontrovertible testimony of nature herself, shows that not only can these diseases in our own species and of our vegetation be prevented, but also in our live-stock. No unprejudiced person will deny that swine plague can be and has been prevented by inoculation, for it is being done in hundreds of cases every day in the year, though I would be the last person to claim perfection for the method. The same is true of Dr. Paquin's work, in Missouri, in the inoculative prevention of the so-called Texas fever in cattle, though he has not yet had time to develop it to the degree which has been my fortune in the prevention of swine plague.

The establishment of such facts is not such a great matter after all. Nature has demonstrated in millions of cases that both diseases are non-recurrent in character, and all that the investigator has to do is to

study the natural disease closely, and repeat her work. If successful in reading nature correctly, the investigator will eventually succeed in producing a mild and non-recurrent form of such a disease with equal certainty to that which takes place under natural laws. I think Freire has been somewhat successful in the preventive inoculation of yellow fever, because I believe he gives sufficient evidence to show that he has the germ in his cultures. You must know that Pasteur successfully inoculated against the rouget, a European swine disease, for several years without ever having seen the germ, and in fact did not know what it was until demonstrated in his own virus by German investigators. No one doubts the successful accomplishments of Pasteur's, Chauveau's, and others preventive inoculation against hen-cholera, black-leg, and anthrax, and yet in not one of these diseases does preventive inoculation stand upon such an incontrovertible amount of testimony as that of the swine plague in this country.

Having called attention to the immense importance of original research to these vital factors in national prosperity, it is but necessary to again recall its importance in relation to development of the next great economical factor in our national resources—the treasures hidden in the earth, our minerals, which contain in their dense structure secrets of unknown and, at present, uncomprehended value that depend upon the investigator to reveal, to make work for our children and our children's children. For the people as a whole to attend to these matters; for them to seek to protect their lives and their food products; to increase their amount and to provide for means of living and the means whereby to earn more to live by, even though they depute the task of providing for and regulating such work to their selected representatives—in other words, to the government—is

"parentalism," is it? If it is, and is neglected on that account, then humanity in this country deserves to go to perdition, and the sooner it goes the better, for to deny the importance of such work to its own welfare would be to condemn the people of this country as a nation of idiots, which they are not, though they have been idiots to allow the individualists among them to usurp their rights and make slaves of them through the subserviency of American politicians. But, "Salvation is free!" The days of individualism and its subservient "boss" are numbered in the land; the people are awakening to the fact that government in this country must be of the people, by the representative intelligence among the people.

ORIGINAL RESEARCH IN THE UNITED STATES.

As nothing to speak of has been done by the government with regard to the mineral resources of the country, and very little as to the agricultural, we may pass over these two factors in our national economics, and come directly to the consideration of original research in relation to the public health and our animal industries, which can be treated under one head. Original research is only possible either from private resources, endowment, or national or state support. We will consider the first two varieties under the head of "Individualism and Original Research."

While original research depends very largely upon the individuality of the investigator for its success, it is true here, as everywhere else in social science, that it suffers and is strangled to death by individualism. That form of individuality in original research which contributes to the benefit of the people may be called individualistic-socialism, or that enthusiasm in the investigator which forces this individuality to express

itself in unrestricted devotion to the welfare of humanity, with utter disregard to self. Those investigators who are simply inspired with vanity for a mere discovery of facts, and to have their names connected with some germ, are not inspired with the true spirit of humanity, and should be classed as scientific monstrosities in the annals of the curiosities of social development. Their spirit is individualistic; not socialistic. They are not scientists in the highest and noblest sense. They are egotistical scientific misers.

Individualism again presents itself in other forms in this country, which are not without interest, one of which is the endowment of laboratories for original research in connection with medical schools by men of wealth, who owe it to the fact that the people, socialism, have allowed too free scope to the individualism of such persons. These institutions owe their endowment mostly to the vanity and cowardice of an individualism which is shrewd enough to recognize the fact that unless it built itself some such monument it would soon pass into perishable forgetfulness, notwithstanding the wealth it has accumulated by means of robber-tariffs and the aggressive absorbing of the property of the people.

Another form in which it asserts itself is that these endowments have been sought and obtained by private, chartered, speculative medical schools, at which the fair name of original research has been prostituted to advertising purposes, and the institutions not devoted to the nobler ones for which they were supposed to have been endowed and advertised as having been erected.

I need quote no actual facts to prove the correctness of these statements to you, but rather ask you to turn to the records and see how many practically valuable facts have been added to the fund of preven-

tive medicine by work done at the Carnegie and Vanderbuilt laboratories in New York, the Hoagland in Brooklyn, and I regret also to have to call your attention to the very small amount of actual work done at Harvard Medical School and Johns Hopkins University. I ask you for the practically valuable facts contributed by these institutions, that is all.

Something in extenuation might be claimed for them in the fact that they are all places of instruction as well, were it not that the Continental laboratories are nearly all also of the same nature, and many of them bear no comparison in extent or fittings to these American affairs. In comparison thereto I call your attention to what Dr. Paquin has done in Missouri in a poorly fitted laboratory, with but little means and no assistance, while, at the same time, attending to the onerous duties of State Veterinarian. Paquin has demonstrated beyond question that Texas fever in cattle can be prevented by inoculation, which has a very intimate bearing on yellow fever. That is more than has been done by all the investigators at the laboratories mentioned combined. I only draw this comparison to emphasize a point which history so far has endorsed, and which futurity will confirm, that to conduct true original research in the interests of the people it must be done in the name of the people, for the people, and controlled by those representing the people. Whatever results have been obtained in either this country or Europe all go to confirm this statement.

I do not deny that an endowment laboratory can be so regulated as to be worked in the interest of the people, but to do so the endowment must be to the people, either to the government, national or state, as an independent national or state institution, but its management must be left to the representatives of the people. In other words, it must become a national

or state institution. It might be casually remarked that this suggestion could be well adopted by some of our wealthy men of broad humanitarian sympathies, for by endowing such institutions (especially in connection with state universities) schools of mines or other institutions for original research in any of the indicated directions, they would confer far more lasting benefits upon humanity than by endowing private institutions, or departments, in connection with any endowed or chartered institutions, for in these state institutions the education is free to the people, and the poorest genius has an equal chance with the richest.

ORIGINAL RESEARCH UNDER GOVERNMENT SUPPORT.

Whatever original research has been done in this country of any practical value to the people has had reference to the prevention of animal diseases, or to do with the feeding and breeding of domestic animals, and thus far has been done at state and not national laboratories. Let me casually remark that the State of Missouri has the proud distinction of being the first of any English-speaking people to select and send a person to Europe, or anywhere else, to especially study and fit himself to do original work in preventive medicine. To my friend, Dr. Paul Paquin, belongs the exclusive distinction of having been thus honored by a state government.

As to what has been done under the auspices of the national government in the interests of preventive medicine, it is only necessary to call your attention to the miserable failure of the investigations in yellow fever, which have been conducted since 1878, and those in animal diseases for the same length of time conducted under the auspices of the Agricultural Department.

The true reason that all this protracted work has been such a dismal failure must be again sought in that extravagant individualism which placed the work in the hands of single individuals, who in their turn have not only done their utmost to monopolize it, but have almost malignantly discouraged the employment of other investigators by the Government or by the States, and so far as the Agricultural Department is concerned, gone so far as to use every possible endeavor to interfere with, stop, or discredit work inaugurated at state laboratories.

These statements are indisputable facts in history, and have ample evidence to their confirmation.

In placing this work in the hands and under the absolute control of single individuals the National Government has been true to and consistent with its ruling principle, which, as has been stated, has consistently been to foster inordinate individualism all possible, regardless of the welfare of the people: that is socialism.

A wiser and far more practical policy would have been to have built a suitable laboratory and employed a large number of competent investigators, and thereby recognized the socialistic principle upon which the government is founded, and also have assured the people some absolutely practical results through the natural ambition and rivalry of a number of workers. When, however, a bill for such a laboratory was placed in Congress, it not only met with the bitter opposition and influence of those investigators who monopolized original research under the support of the government, but also found no support from the medical journals of the country (with a few exceptions), simply because they are largely the organs of schools, or because the editors are too ignorant to appreciate the fact that the medical profession holds, in a measure as a public trust, the public health, which it

should do its utmost to protect in every way possible. The imbecilic sarcasms of the public press do not deserve attention. To the credit of the great live-stock press of the country it may be said that it generally supported the bill, with an intelligence and unanimity of purpose which was strongly endorsed by the live-stock breeders' associations of the country.

A NATIONAL SCHOOL OF SCIENCES FOR THE CONDUCT
OF ORIGINAL RESEARCH AND THE EDUCATION
OF INVESTIGATORS.

As has been just mentioned, a bill for a national patho-biological laboratory for the study of human and animal diseases has been before Congress for the past two years, and though temporarily killed by the natural enemies of the people, the political investigators in the employ of the government, it still retains vitality enough to come up again and again as a pretty lively corpse, and will eventually be passed, unless the suggestion about to be made should receive more general acceptance, of which it is far more worthy. As, however, the laboratories for which the bill in question provides, are of primary importance, I introduce a copy here, in hopes that it may attract the attention it deserves.

"A BILL
FOR THE ESTABLISHMENT OF A NATIONAL
LABORATORY.

"*Section 1.* Be it enacted by the House of Representatives and Senate of the United States of America in Congress Assembled, that, for the purpose of better protection to the health of the people of the United States from the ravages of contagious, infectious, and malarial diseases, and for the preservation and protection of the great live-stock interests of the

country from the decimating devastations of pestiferous diseases of a similar nature, and for the more complete elucidation of the relation existing between many diseases of our domestic animals and the life and health of human beings, whose business calls them into intimate relations with them, and of the welfare of the public as consumers of drinking water, food, drugs, animal food or animal products, there shall be established at Washington, in the district of Columbia and the United States of America, a laboratory for the purpose of making a continuous and scientific study into the causes and nature of the classes of diseases herein mentioned, and of all the subjects connected therewith bearing either upon the public health or animal economies of the country, and that said laboratory be known as the National Laboratory of the United States.

"*Sec. 2.* The laboratory shall be in two departments, and the general supervision and control of said patho-biological laboratory shall be in the hands of the Secretary of Agriculture and the Supervising Surgeon-General of the Marine Hospital Service, who shall, at the completion of the buildings and grounds herein provided for, appoint two distinct and independent directors, each of whom shall be respectively the head of a distinct and independent department of investigation, and who shall be known, respectively, as the director of the humano-patho-biological and the zoo-patho-biological institutes of the national laboratory of the United States. The directors of the institutes named above shall be competent and skilled patho-bacteriologists, the one in human, the other in animal diseases, and shall, respectively, be graduates from a medical or veterinary school, college, or department of some university, and shall have each been engaged in and have published in some accredited journal or report, investigations which have

gained for him a reputation in the medical-scientific world, and have demonstrated his fitness for the position and responsibilities herein provided for.

"*Sec. 3.* That the salaries of the directors of the institutions above mentioned shall be five thousand dollars per annum.

"*Sec. 4.* That the Secretary of Agriculture and said Surgeon-General shall, respectively, appoint, or detail from the general service, an assistant to each institute provided for in section 2, at a salary of two thousand five hundred dollars each; one assistant to be a creditably graduated doctor of medicine, and the other a doctor of veterinary medicine, both of whom shall be citizens of the United States, and shall have done creditable work in the field of patho-bacteriological investigation.

"*Sec. 5.* That the directors of each of said institutes named shall appoint, subject to the approval of the Secretary of Agriculture and Supervising Surgeon-General of the United States Marine Hospital Service, respectively, such other assistants and servants as shall be necessary to carry on the work herein provided for.

"*Sec. 6.* That the directors of each of said institutes shall, with the approval of the said Secretary, or the said Surgeon-General, appoint to each of the institutes named a competent chemist, each of whom shall be competent to conduct investigations in search of the character and value of the ptomaines or toxins produced in the evolution of micro-organismal life, and who shall have previously distinguished himself in the line of research. The salary of said chemists shall be five thousand dollars per annum. The directors aforesaid are authorized also to employ such assistants and servants for the aid of the said chemists as shall be necessary to the faithful and thorough conducting of their investigations.

"*Sec. 7.* That the salaries of the persons herein named in connection with the work of the pathological laboratory of the United States shall be paid out of the funds in the Treasury, upon requisitions drawn by the Secretary of Agriculture and said Surgeon-General, respectively.

Provided further, That in order to stimulate and encourage original research into the cause and nature of the classes of diseases herein mentioned, the Secretary of Agriculture and said Surgeon-General are hereby authorized to offer the free use of such rooms and appurtenances in their respective departments of the said laboratory as shall be provided therefor in said laboratory, to a limited number of citizens of the United States as may volunteer their services, at their own expense, and who are known to them to have been creditable graduates of an honorable veterinary or medical school or college, and to have distinguished themselves by original research in the class of investigations herein provided for; the room, necessary materials, and appliances to be supplied them without charge. Said voluntary workers shall agree, in writing, to accept two young medical or veterinary students of American schools or colleges, to be selected by the Secretary of Agriculture and said Supervising Surgeon-General, respectively, as assistants and students, and to instruct them in the lines of work they may be engaged upon. Such students shall receive no compensation, and must be at their own expense, except as to the instruments and implements necessary to work with. The said volunteer investigators in either department must, furthermore, agree, in writing, to continue any given series of investigation commenced until completed to the satisfaction of the Secretary of Agriculture and said Supervising Surgeon-General, respectively, unless otherwise excused thereby, and must further agree to engage upon any

special line of research collateral thereto that may be deemed necessary by the director of the institute of the laboratory in which they may be engaged. They must further agree that all the results and benefits of any work performed by them in any department of this laboratory shall become the property of the Government of the United States of America, and be reported in a full and exact manner for publication in the reports of the same. With and by the consent of the director of the institute of this laboratory in which such a volunteer may be working, and with the written agreement aforesaid, such volunteer investigators may have the privilege of publishing advance reports of their work in the medical or scientific journals of the country.

Provided further, That the sum of five hundred and fifty thousand dollars be hereby appropriated from funds in the Treasury of the United States for the purpose of purchasing the necessary land in the city of Washington, and for grading and fencing the same, and for the erection of the necessary buildings thereon and the equipment of the same, in accordance to the use herein provided for. For the purchasing, grading and fencing the land, one hundred and fifty thousand dollars; for a laboratory building, two hundred thousand dollars; necessary apparatus and equipment of the same, one hundred thousand dollars; for stables, pens, cages, and so forth, and residences for grooms, employés, one hundred thousand dollars.

Sec. 8. That the Secretary of the Treasury of the United States, the Secretary of Agriculture, and the Supervising Surgeon-General of the Marine Hospital Service shall constitute a Board of Trustees and a Building and Purchasing Committee for the said laboratory, and the persons named are hereby empowered to purchase a location, secure the necessary

plans, and build and equip the said institution in the manner herein provided for, and to draw the necessary warrants for the payment of same, in accordance to the letter of this Act.

"*Sec. 9.* The Secretary of Agriculture and the Supervising Surgeon-General of the Marine Hospital Service shall each year, respectively, submit an estimate to the Secretary of the Treasury for such appropriation as may be deemed necessary for the maintenance and preservation of the laboratory, and the salary of the officers and employés, and full reports of the operations of the laboratory shall be included in their annual reports."

During the late session of Congress Mr. Edmunds, of Vermont, introduced a bill for the erection of a National University to be built by the Government in commemoration of the discovery by Christopher Columbus.

The idea is grand from every point of view, could we but have a National University where every branch of original research and study would be conducted on the highest and most exact principles of scientific investigation; where the truth alone would be sought and taught utterly regardless of the idols it demolished, or the ideas sanctified by usage, which it crushed to the ground; where the poorest youths of the land, male or female, having the genius for and the hunger to acquire scientific knowledge, could have the freest opportunity, regardless of expense, and where bigotry and intolerance of any and every kind would be absolutely certain of being barred out; where religion would be studied in the spirit of its twin-sister, original research, and where the theological devil could never work in his discordant horns. Could we have such an institution of education and general research as that, its value to the country could not well be estimated. Personally,

however, I have a dread of the very name university. Not only in this country but in England that name suggests a theological suspicion, and to have that influence control, or even enter a national institution of education or research, would be absolutely certain to damn its influence and advancement for an indefinite number of years; but, could we have such an institution on the German plan, every scientist, every broad and humanitarian mind in this country, every honest physician should, and probably would, gladly advocate its erection and organization.

I am dead set against any encouragement whatever to the entrance of the theological devil into all or any government educational institutions. It is present in one form or another and doing serious injury to-day in every one of our state universities and most of our public schools, and no matter how small an entrance it may have obtained, it has proved a wedge of contention and serious disturbance in every instance. More than that, it seriously checks the employment of the best and freest minds, and makes hypocrites and liars of men, who would otherwise prove true to their secret and honest convictions. Wherever present it checks the development of a free and honest manhood or womanhood in both instructors and students.

Every honest teacher in our state universities and public schools, and even those who have not the courage to be honest, knows that I but speak the simple truth.

Do not think that I am an enemy to the theologians or churches. They have their place and will have probably as long as humanity exists, unless that millennial condition is finally reached where all men of mature years will walk in complete unison with the laws of nature. But, with the highest education according to the best knowledge of to-day, theology

has nothing to do. It is based on ignorance and its twin-sister, superstition. It deals in mystery, miracle and darkness, and fears and dreads the advancing light of the sun of true original research.

On the other hand, I have endeavored, and hope successfully, to show you that the country absolutely needs a place for the education of original investigators, and for the conduct of the lines of research which have been called to your attention, and which certainly promise, from past and present results, so many benefits to the people of this country and humanity at large.

The idea suggested in Mr. Edmund's bill is certainly not unworthy of the people of this country, and absolutely certain of contributing more lasting and profound benefits upon them than a hundred "Columbus Expositions," which are but fleeting things, and leave but few permanent benefits behind them. Hence, it would seem to be far better and sure to lead to grander results if Congress would provide for a number of schools or institutes for the education of original researches in every department of natural science, and especially to include the laboratories provided for in the bill already introduced, to be known as the

COLUMBIAN INSTITUTE OF ALLIED SCIENCES.

With this suggestion I close this paper, hoping that the questions brought therein to your attention will receive the earnest thought and endorsement they intrinsically deserve, though the manner of their presentation may not have been so acceptable to your minds.

