itself and also serve as a check upon the rest; and the results, while not unimpeachable, ought to give us a true estimate of the present condition and future prospects of each eye and ear in the school, such as has all too rarely been even attempted in school investigations. Couple with this a record of the needed anthropometric data of height, body and limb girth, leg and thigh length, elbow height when seated and the condition of the spine; and we may be said to know the physical condition of each scholar, so far as is needful for the safeguarding of the organs of sight and hearing. With these data in the hands of the school authorities and the parents, perversity alone should prevent the application of preventive medicine to those individuals most in need of it.

THE PROPER RELATIONS BETWEEN NATIONAL, STATE AND MUNICI- PAL QUARANTINES.

Read in the Section on State Medicine at the Forty-sixth Annual Meeting of the American Medical Association, held at Baltimore, Md., May 7-10, 1895.

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I think it must be evident that the machinery of quarantine administration best adapted to the needs of any particular country has to be determined by the political organization and commercial institutions of such country. It is hence easy to understand that a system of quarantine that might be best for England or France, or for China or Hindoostan, might not be best for the United States or for the State of Alabama.

Our system of government is very complex. We have the federal government for the management of foreign affairs and the commerce between the States. We have the State government, with large powers, for the regulation of internal and domestic affairs and the conservation of the lives, the liberties and the property of the people. Within the State, and deriving their powers from the State, we have the counties and the municipalities invested with important jurisdictions and extending the principles of home rule to the utmost practicable limits. In view of these statements it would seem to be a plausible contention that all these concurrent and coöperative governmental bodies should concur and coöperate in the management of quarantines for the protection of the people against the introduction and dissemination of migrating pestilences, just as they might all concur and coöperate to oppose the invasion and subsequent progress of an army with banners.

Here it becomes necessary to inquire what is meant by the word quarantine, in the phraseology of the question under discussion, because there are practically several different kinds of quarantine.

1. There is maritime quarantine, or quarantine to oppose the importation of epidemic diseases by way of the sea from foreign countries.

2. There is inter-State quarantine to oppose the spread of epidemic diseases from one State into another State, by way of rivers and railroads, and other means of communication between the States.

3. There is intra-State quarantine, or quarantine to oppose the spread of epidemic diseases from one part of a State to another part of the same State, by the ordinary avenues of traffic and travel.

4. There is municipal or local quarantine, or quarantine involving the management of epidemic dis-

eases in a city or a country community, so as to limit the local spread of such diseases and lessen their disastrous consequences.

These statements open the way for the examination of the question of national quarantine jurisdiction, both in its legal and in its practical relations. Has Congress the right to establish and conduct quarantines? And if so, what sort of quarantines? Maritime quarantine? Inter-State quarantine? Intra-State quarantine? Municipal quarantine? No power to legislate in regard to any sort of quarantine is expressly given in the Constitution, and if such power exists it must be involved in the power to regulate commerce with foreign nations and between the States; and under this section of the Constitution, Congress would have to confine its legislative action to the regulation of maritime and inter-State quarantine. It manifestly could not legislate for the regulation of intra-State and municipal quarantine.

The Supreme Court of the United States has never had occasion to decide any case in which this question of the quarantine power of the general government was directly at issue, and consequently the ultimate issue in regard to it is unsettled and uncertain, and we are left without other guidance than the opinion of legal experts, and among these there is a wide difference of opinion. But not even the most thorough-going advocate of the supremacy of the federal power would go further than I have gone in the statement just made, to the effect that the quarantine powers of Congress can not go beyond the regulation of foreign and inter-State quarantine.

In the meantime, without waiting for the judicial settlement of these constitutional questions, Congress has from time to time enacted quarantine and health laws which have played a large part in the recent sanitary history of the country.

In 1879, the National Board of Health was established, with no power to inaugurate or to control quarantines, but with power to act in coöperation with State and local health boards and to afford them financial assistance. To this end the National Board was intrusted with the administration of a large epidemic fund.

A few years later this board fell into bad repute and the distribution of the epidemic fund was placed in the hands of the Marine-Hospital Service, and it was provided that it should still be used in coöperation with the health authorities of the States.

In 1890 Congress passed a very important act for the regulation of inter-State quarantine under the supervision of the Marine-Hospital Service. This act provides that whenever it shall be made to appear to the satisfaction of the President, that cholera, yellow fever, smallpox or plague exists in any State or territory, and that there is danger of the spread of such disease into any other State or territory, he is authorized to cause the Secretary of the Treasury to promulgate such regulations as may, in his judgment, be considered necessary to prevent such spread—such rules to be prepared by the Supervising Surgeon-General of the Marine-Hospital Service.

Again, in 1893, under the stimulus of the big panic caused by the widespread prevalence of cholera in Europe, Congress passed another act giving very large additional quarantine powers to the Marine-Hospital Service. Of this act, the following is the most significant section:

SEC. 3.—That the Supervising Surgeon-General of the

Marine-Hospital Service shall, immediately after this act takes effect, examine the quarantine regulations of all State and municipal boards of health, and shall, under the direction of the Secretary of the Treasury, coöperate with and aid State and municipal boards of health in the execution and enforcement of the rules and regulations of such boards and in the execution and enforcement of the rules and regulations made by the Secretary of the Treasury to prevent the introduction of contagious or infectious diseases into the United States from foreign countries, and into one State or Territory or the District of Columbia from another State or Territory or the District of Columbia; and all rules and regulations made by the Secretary of the Treasury shall operate uniformly and in no manner discriminate against any port or place; and at such ports and places within the United States as have no quarantine regulations under State or municipal authority, where such regulations are, in the opinion of the Secretary of the Treasury, necessary to prevent the introduction of contagious or infectious diseases into the United States from foreign countries, or into one State or Territory or the District of Columbia from another State or Territory or the District of Columbia, and at such ports and places within the United States where quarantine regulations exist under the authority of the State or municipality which, in the opinion of the Secretary of the Treasury, are not sufficient to prevent the introduction of such diseases in the United States, or into one State or Territory or the District of Columbia from another State or Territory or the District of Columbia, the Secretary of the Treasury shall, in his judgment it is necessary and proper, make such additional rules and regulations as are necessary to prevent the introduction of such diseases into the United States from foreign countries, or into one State or Territory or the District of Columbia from another State or Territory or the District of Columbia, and when said rules and regulations have been made they shall be promulgated by the Secretary of the Treasury and enforced by the sanitary authorities of the States and municipalities, where the State or municipal health authorities will undertake to execute and enforce them; but if the State or municipal authorities shall fail or refuse to enforce said rules and regulations the President shall execute and enforce the same and adopt such measures as in his judgment shall be necessary to prevent the introduction or spread of such diseases, and may detail or appoint officers for that purpose. The Secretary of the Treasury shall make such rules and regulations as are necessary to be observed by vessels at the port of departure and on the voyage, where such vessels sail from any foreign port or place in the United States, to secure the best sanitary condition of such vessel, her cargo, passengers and crew; which shall be published and communicated to and enforced by the consular officers of the United States. None of the penalties herein imposed shall attach to any vessel or owner or officer thereof until a copy of this act, with the rules and regulations made in pursuance thereof, has been posted up in the office of the consul or other consular officer of the United States for ten days, in the port from which said vessel sailed; and the certificate of such consul or consular officer over his official signature shall be competent evidence of such posting in any court of the United States."

It will be observed that the first of these two recent acts relates to inter-State quarantine exclusively, while the second act provides for both inter-State and maritime quarantine. In both, provision is made for the recognition of local quarantines; provided said local quarantines are conducted under regulations satisfactory to the Secretary of the Treasury, or to the Supervising Surgeon-General of the Marine-Hospital Service which is practically the same thing. Of course, with that power, the Surgeon-General will have it all his own way.

But does this high officer know any more than the rest of us how quarantines ought to be conducted? If so, where did he get his expert knowledge? There is only one way for anybody to get expert knowledge of quarantine, and that is by practical quarantine experience. Some of the medical officers of this Service have seen some yellow fever, and a few of them have seen a good deal of yellow fever; while a few of them have had some experience in quarantine work.

But if any of them have acquired any large amount of expert knowledge either of yellow fever or of quarantine no proof of it has been vouchsafed to the outside world.

It seems to be taken for granted, by a great many persons, that a quarantine conducted under federal authority will be safer and more to be depended upon than quarantine conducted by local health authorities. But to my mind this is a very questionable proposition, and it certainly finds no warrant in our recent quarantine history. They always have plenty of money to spend—these national quarantine officers—and they know how to spend it admirably well. A rapid historical sketch of what they have done in the way of quarantine work up to this time is not without a certain measure of interest.

In 1879 the National Board of Health appropriated \$50,000 to the Tennessee State Board of Health to prevent the extension of yellow fever from the city of Memphis, where it was then prevalent to the rest of the State. They appropriated, also, at the same time \$12,000 to the Mississippi State Board of Health, and \$8,000 to the Alabama State Board of Health for the protection of their respective States. The fever did not spread in Tennessee or in Mississippi, both of which took the money. Neither did it spread in Alabama which did not take the money; and I undertake to say, as a quarantine expert, that so far as the prevention of the spread of the fever was concerned the \$62,000 so expended was very nearly thrown away.

A few years later, the Marine-Hospital Service and the State of Texas together expended the monstrous sum of \$100,000 to fence up yellow fever in the town of Brownsville on the Rio Grande, opposite the Mexican town of Matamoras. This, in my judgment, was a wanton waste of money. There might have been good reason for spending \$5,000, but hardly for more.

In 1883, the Marine-Hospital Service had charge of the Pensacola quarantine, or at any rate it was in charge of a medical officer of that Service. That year yellow fever got through the quarantine into Pensacola and into the Navy Yard near Pensacola. The Marine-Hospital Service proceeded to put a cordon around the Navy Yard for the protection of the rest of the country, but left Pensacola to scatter the disease over the adjacent portions of Florida and Alabama, as, for example, to Millview, Oakfield, Brewton and Daphne.

In 1887-88, yellow fever spread widely over the State of Florida, and the Marine-Hospital Service was appealed to for help, and responded in its usual energetic and lavish fashion. So far as the State of Florida was concerned, the effort to prevent the dissemination of the fever does not seem to have borne much fruit. Some protection was probably afforded to the State of Georgia. What the cost of this enterprise was to the government I was never able to find out; but it must have been very great. One item I remember—the expenditure of \$60,000 in the absurd and utterly useless work of the post-epidemic disinfection of the city of Jacksonville.

In 1893, at Brunswick, Ga., a case of yellow fever got through the quarantine and died at a logging camp somewhere near that city. Whereupon the Marine-Hospital Service declared the Brunswick quarantine to be inefficient and pushed the local authorities aside, and took charge themselves. The experiment was an unfortunate one. In a short time thereafter, yellow fever broke out in the city, the first

case so far as known occurring in the person of Surgeon Brannan, whom they had made quarantine officer. The next thing the Marine-Hospital Service did was to invade the territory of the sovereign State of Georgia and take possession of Brunswick under the plea of inter-State quarantine, and with the cordon and the camp of detention undertook to confine the epidemic to the stricken city. Yellow fever spread to Jessup before the cordon was drawn around Brunswick. But why was not Jessup also subjected to the potent coercion of the cordon? If the cordon prevented the spread of yellow fever from Brunswick, what prevented its spread from Jessup?

I have given this brief sketch of the history of the quarantine achievements of the general government, with the object in view of calling special attention to what I regard as a very serious menace to the authority and usefulness of our State health authorities—to the danger, namely, that all the quarantine functions which naturally belong to the State health authorities may be absorbed and monopolized by the Marine-Hospital Service, or by some other agency of the federal government. A few of the large cities like New York, or New Orleans, or Boston, will resist the innovation for a long time, but there is danger that smaller ports will yield speedily, and that the large ones will finally also give way.

Some plausible reasons may be urged in favor of national sea quarantine. Quarantine is an incident of commerce, and it would seem to be the natural solution of the problem that the power which regulates commerce should also regulate quarantine. The great objection to this solution of the problem of sea quarantine is that it involves a central bureaucratic administration that is necessarily expensive, necessarily arbitrary, and necessarily based on insufficient knowledge of local circumstances and conditions. It would not be difficult to frame a quarantine system in which, by the thorough-going coöperation of national and State authorities, most of these objections could be obviated.

There are just three places in which to oppose the dissemination of migrating pestilences in connection with the transportation of passengers, immigrants, and merchandise. The first of these is at the port of departure in the foreign country. The second is at the port of arrival in this country. The third is at the place of destination in the interior of the country, at the end of the journey. The quarantine of the foreign port, including the inspection and disinfection of ships, passengers, immigrants, and merchandise, and a general system of bills of health and cable notification when anything is wrong—all these things should be in charge of officers of the national government. And there should be at suitable places along our sea coast, refuge stations for dealing with infected ships, crews, passengers and cargoes; and these refuge stations should also be under national control.

Inside of the refuge stations, there should be an inner line of defenses in the shape of local inspection stations at our various seaports; and these should be in the hands of the local or State officers.

Then, from time to time, when in spite of all these defenses some epidemic pestilence gets into the country, we will need to institute land quarantines, railroad quarantines, local quarantines according to circumstances; and these should be under the control of the State and local authorities. If the pesti-

lence swells beyond the power of control at the command of the State and local authorities, then the national government should come to their assistance, not to push them aside as was done in Brunswick, but in the way of supplement and coöperation.

This is in outline the theory of our present quarantine system—the system that has been developed during the last twenty years. I can imagine no better system if it is carried out in its real spirit and purpose. But it now stands in danger of being marred and outraged by the encroachments of the Marine-Hospital Service under the acts of 1890 and 1893—said Service not being satisfied with the control at foreign ports and on the high seas and at the refuge stations, but seeking also the control of the inspection stations and of internal quarantines.

TUBERCULOSIS AND ITS PREVENTION.

Read in the Section on State Medicine, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

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Living, as I have, for the past few years, in a region of the Rockies, where hundreds of consumptives annually come to breathe the pure invigorating atmosphere, hoping to regain lost health and wasted strength, my mind has constantly turned toward the peril to our inhabitants of contagion from these invalids. Although in our high altitude the risk is greatly diminished, still "how to prevent the danger" has been an ever recurring question, and when your chairman kindly invited me to prepare a paper on "Preventive Medicine," my thoughts naturally turned to this subject.

With no space for argument in favor of statistics and cases brought forth by advanced thinkers in their researches, I simply accept their conclusions based on their proofs of facts. My ideas may be crude and my theories familiar, still if they stimulate action along the line of duty that is before us, as earnest and intelligent workers for humanity, I shall accomplish my purpose.

For thousands of years, it may be from the time Adam and Eve bade adieu to fair Eden, to battle with sorrow and death, consumption has been the great enemy of mankind. Men of thought and action have for the sake of their fellowmen, stood up and fought, with the best weapons at their command, and failed to conquer this great destroyer. Here and there down the ages have been seen the beacon fires of progress, until in 1892, Koch kindled a blaze that illumined the whole world. Then the clouds of ignorance lifted, giving us a vision of the boundless realms of preventive medicine. While the advance in curative medicine has been wonderful, the strides made in preventive medicine have been miraculous, and yet we are only on the border line of the Land of Promise, and there is still room for discoveries in preventive medicine. An earnest seeker of dauntless courage may achieve brilliant results in this line of work that will add new luster to our glory as physicians, and longer life to humanity. To-day, men are beginning to judge a physician's success by his ability to prevent as well as to cure disease.

The field is broadening. As we gain knowledge we increase in strength. We need men of strong character and keen intellect to fight the battle of life