other purposes, but it cannot fail to interest a large number of the readers of *Science*. By reference to the map, it would appear that Captains Lewis and Clarke received no intimation whatever of the interior drainage of the Columbia. They represent the entire area of the Great Basin and the Snake River country as drained by the Missouri and the Yellowstone. The Yellowstone, named by them before reaching it, is shown as a longer river than the Missouri, rising as far south as the 39th parallel of north latitude, near the sources of the Rio Grande. In their map published in 1814 the drainage-area is already much restricted, and the river represented as finding its source in a large lake.

It is well known to all students familiar with the history of the North-west that the Yellowstone received its name in very early times. To most visitors to the Yellowstone National Park, however, the origin of the name is always a matter of special inquiry. It may be well, therefore, to add that Lewis and Clarke encamped near the junction of the Missouri and Yellowstone, April 26, 1805, seventeen days after leaving Fort Mandan. In their journal occurs the following: "This river, which had been known to the French as the *Roche jaune*, or, as we have called it, the Yellowstone, rises, according to Indian information, in the Rocky Mountains; its sources are near those of the Missouri and the Platte, and it may be navigated in canoes almost to its head."

On the map there is one very significant designation to a comparatively small river quite remote from the country the party intended to traverse. In the region which has since been set apart as the National Park a small stream is shown tributary to the Yellowstone River, and curiously designated as 'Stinking Cabin River.' 'Brimstone' and 'Stinking Water' are names found on the maps of this region since the days of Colter's trip through the Yellowstone Park region, in 1807. But this still earlier name suggests that some adventurous *voyageur* unknown to history had already penetrated the country which has since become world-renowned for its remarkable thermal waters.

On the north side of the Missouri, Milk River is well represented on the map, but undesignated except by the amusing note, "The Indians call this the river which scolds at all other rivers."

The coast-line of the Pacific and Puget Sound is of course taken from early English admiralty charts, and doubtless in the possession of the distinguished explorer, Meriwether Lewis.

ARNOLD HAGUE.

SANITARY SCIENCE AND EDUCATION.[1]

GENTLEMEN, — When I accepted the invitation of your president to participate in this discussion, it was not in the hope of being able to add any thing to the general store of information on sanitary topics, for sanitation and hygienic science are subjects that, on their technical side, I know very little about; but I accepted Dr. Newton's invitation because as a teacher, and one who is engaged in the training of teachers, I desired to express my appreciation of the importance of sanitary science for sound educational doctrine and correct educational practice, and to add my testimony to that of the other gentlemen who are to address you, to the fact that your researches and conclusions are of the greatest practical value to us.

Mens sana in corpore sano is as much to be prayed for now as it was in the time of Juvenal, and we are far better equipped than was the satirist or his contemporaries to work toward that end. The sound mind and the sound body seemed to the Roman to be two distinct and separate things whose conjunction was desirable. We have come to know that the two are so intimately related, indeed so interdependent, as to be practically one thing. Aristotle furnished the educators of antiquity with a psychology upon which to base their praxis. It was a wonderful achievement. But the great modern science of physiology, whose beginnings are to be seen in the discoveries of Servetus, Harvey, Leeuwenhoeck, and others, compelled the entire rewriting of that science; and the result is an infinitely more complex and accurate and practical, though less final psychology, than that which was bequeathed to us by the great Stagyrite. This new psychology has taught us how truly vital the dependence of mind on body is. We know, for example, that a decreased or impoverished supply of blood to the brain produces mental inertia and lassitude. We know that an organ develops by exercise, and that the neglect of an organ or its excessive stimulation is alike harmful, no matter whether the organ be mental or physical. We can promptly and surely trace the mental results from unduly intense or too prolonged brain-work, from lack of exercise, and from improper nutrition. We are aware, in like manner, of the bodily results induced by the various emotions and passions, by expectant attention, by concentrated will-power, and other mental phenomena.

Now, it seems to me that it is just at this point that the sanitarian and the educator join hands. Both having a full understanding of the relation that subsists between mind and body, the former brings the results of his studies to the latter, and formulates them into suggestions and rules for the teacher's guidance. The teacher, in return, adopts these suggestions and rules as parts of his science, and communicates to the sanitarian in due time the effects that follow such adoption. Thus sanitary science is aided in one of its most important applications, and the science of education adds a most valuable chapter to its book.

Perhaps this co-operation of sanitarian and educator is more ideal than real, but it is nevertheless far more noticeable now than it was twenty-five or even ten years ago. This is proved, if proof be needed, by the fact that instruction in physiology and hygiene, and in the mental and physical effects of stimulants and narcotics, has been generally added to the curriculum of the common school within that period. It is not to be disputed, on the other hand, that much remains to be done. An illustration of this will be found in one of the opening pages of a recent book on the ventilation and warming of school-buildings, by Mr. Morrison of Kansas City. The author reminds us (p. 18) that "no subject has been more carefully and intelligently studied than the direct and ultimate effects of improper air on the human system, and that on no subject is there greater unanimity of competent opinion." School-building goes on, however, year after year, and it goes on in too many cases utterly regardless of whether a child vitiates two cubic feet of air per hour or two thousand cubic feet, whether 62° F. is the better average temperature or 82°, or whether 45 per cent of saturation is desirable in the atmosphere or 70 per cent. Nevertheless, science and common sense are making headway, and there is every reason to believe that in a few years' time all the school-buildings that are erected, however humble and unpretentious they may be, will be well ventilated and properly heated.

You will pardon, Mr. President, my apparent digression from the four specified subjects of this evening's discussion, for it seems to me that it is only on such broad lines as those which I have indicated, that these questions can profitably be considered. It would be no great advantage were we to bring together a mass of merely empirical statements. We must get below the statements to the facts and principles which explain them. We want to get at the philosophical and scientific reason for the relation that sanitation bears to education. We want to understand exactly what it is that is common to both sciences. That much being clearly before us, the application of the results of the former science to the problems of the latter is not a difficult matter.

The educational topics before you are four: (A) the length of school days and terms, (B) recesses, (C) competition, (D) industrial education. I shall pass over the first two in order to say a word about each of the others. These are competition and industrial education. Permit me a few words concerning each.

Competition may be defined as a common striving for the same end. It involves two or more competitors. As a principle it has long been dominant, not only in business-life, but in the science of economics. It has been prescribed as the proper stimulus for all stagnation, and as the solvent for all difficulties. Of late years, however, a school of economic thinkers has arisen which asserts that unrestricted competition is an evil to humanity and to the State. We are told that it is proved to be demoralizing, destructive, and, as a principle of political economy, inefficient. Have not you sanitarians and have not we teachers reached an analogous conclusion as to competition in our common field? Is not competition, when

[1] Abstract of an address by Nicholas Murray Butler, Ph.D., president of the Industrial Education Association's College for the Training of Teachers, delivered at the thirteenth annual meeting of the New Jersey Sanitary Association, held at Trenton, Oct. 28, 1887.

left to itself, in danger of emphasizing material success at the expense of the disciplinary process? I take it we are all agreed that how a pupil learns is of more importance than what he learns. His faculties are developed and his character formed by the process of learning, far more than they are by the thing learned. The tendency of unrestricted competition is to alter this relation, to exalt the result, and to depreciate the process. This is contrary to the teaching of mental hygiene, and in consequence is to be condemned by sanitarians and educators alike. I say nothing of the pallid faces, the disordered nerves, the sleepless nights, and the loss of appetite, that result from competition for competition's sake. Were those results not present, I should still oppose it as an unsound educational principle. Therefore I repeat, competition must be restricted and kept within reasonable bounds. This topic gives rise to many other fruitful suggestions, but I must pass them by.

There remains the subject of industrial education. Let me, in as few words as possible, place that properly before you, and then I am confident that the attitude toward it of a science of sanitation that is broad enough to demand a well-developed mind in a well-developed body will not be for a moment doubtful.

Industrial education is not technical education, the preparation for trades. It is a term invented to signify an education in which mental training through the hand and the eye occupies its proper place beside mental training through the memory and the other means of approach to the mind. Mental training through the hand and the eye is generally known as 'manual training,' which term is only satisfactory in case its proper signification is understood. This manual training is graded instruction, the object of which is to develop the pupil's powers of expression. No piece of knowledge is really our own until we can express or apply it. Mere memorized knowledge is parrot knowledge. It is mentally indigestible and innutritious. It is the pastry of the intellect. Well enough, perhaps, if taken in proper quantities and at proper times, but very unsatisfactory and unwholesome as a steady diet.

Reading and writing both appeal in a measure to the child's powers of expression, but not sufficiently nor in the most natural and simplest way. Expression by means of language is abstract and comparatively difficult. When carried to any great degree of fluency or accuracy, it is universally looked upon as an accomplishment. The earlier and simpler methods of expression are by gesture, by delineation, and by construction. Industrial education takes these powers of expression, delineation, and construction, and trains them together with the other faculties. Drawing and construction, the latter in material suited to the strength and capacity of the pupil, are reduced to a system, and go hand in hand with instruction in the three R's. Thus the sense of form, of proportion, of accuracy, and of truth is developed as is possible in no other way. The judgment and the executive faculty, the most important of all our powers in the practical work of life, are provided for and trained in the scheme of industrial education, though accorded no place in the old-fashioned curriculum.

Now, sanitation has been called the 'science of preventive medicine,' and lectureships with that title have been founded in Great Britain. In connection with this description of your science, let us remember that we are told on high authority that the number and variety of diseases and disorders that are traceable to the mind are rapidly increasing. If this statement is true (and I know of no reason to doubt it), in what direction can our sanitarians better expend their energies than in furthering the adoption and development of an educational system that is complete, that is thorough, and that is healthy? This is certainly a proper field for the activities of 'preventive medicine.'

Time will not permit me to follow out this suggestive theme. I will simply state, in conclusion, a few of the reasons why I consider industrial education a matter of importance to sanitarians. In industrial education, properly organized and administered, I claim that we have for the first time a system that trains all the mental faculties, and each at the proper time and in proper proportion. It gives us no abnormal and mechanical memories without judgment and executive ability, no hunched backs without arms and legs. Every faculty is considered, every power is taken into account. The conditions of nineteenth-century life are kept in mind, and the ideally educated man is not held to be the mediæval recluse or the eighteenth-century English gentleman. Incidentally, industrial education affords a pleasant and healthful alternation of exercise from faculty to faculty. No one is overstrained, no one is allowed to become atrophied and die. Muscular exertion is called in to supplement and relieve mental activity.

My own belief is that the mere recital of these facts determines the attitude of sanitarians toward the system which permits and causes them. As friends of educational and scientific progress you will approve industrial education, and then as sanitarians you will indorse it as a long step toward the much-to-be-desired *Mens sana in corpore sano.*

THE AMERICAN ORIENTAL ASSOCIATION.

THE fall meeting of the American Oriental Society was held on Oct. 26 and 27, at the Johns Hopkins University. Since the establishment of this university a little over ten years ago, Baltimore has grown to be one of the great centres of education and learning in this country. A 'university' atmosphere pervades the place, and the large audience that gathered in Hopkins Hall at the opening session on Wednesday afternoon may be taken as an indication that the interest felt there for higher studies and researches extends to regions that seem (but only seem) to lie so far off as those covered by the Oriental Society.

In the absence of Professor Whitney, who, although considerably improved in health, is still obliged to be sparing of his strength Vice-President Dr. W. H. Ward of New York presided.

The reading of papers was begun by Professor Haupt of the Johns Hopkins, who presented the prolegomena to his forthcoming Assyrian grammar, — a work on which he has been engaged for a number of years. The extent of the literature in cuneiform characters is appreciated only by very few persons; and even of those present at the meeting, no doubt quite a number were surprised to learn, that, as far as known to us, it covers a period of at least forty centuries. There is a short inscription of King Sargon of Agade, the date of which can be fixed with certainty at 3800 B.C., and on the other side Antiochus Soter (280–261 B.C.) tells us in a cuneiform tablet of a temple he had erected in honor of a Babylonian deity. Professor Haupt, after speaking of the various periods to be distinguished in Babylonian-Assyrian literature, dwelt at length on some of the features of the Assyrian language, showing, more especially, the relationship that existed between it and the cognate Semitic tongues. In a brief discussion of the paper, Professor Jastrow, after alluding to the eagerness with which students and scholars have been looking forward for some time to the grammar of Professor Haupt, who stands to-day without a superior, and with but few equals among Assyriologists, spoke of the 'Sumero-Akkadian' controversy, which is attracting considerable attention just at present. He regretted the confusion which incautious writers are bringing about by unnecessarily complicating the points at issue with questions and theories that have no bearing on the subject.

Professor Bloomfield followed with an exhaustive study of certain magical rites in cases of disease, as laid down in the Athavar-Veda. Professor Lyon of Cambridge announced the recent purchase by the Harvard University of a collection of Babylonian so-called 'contract tablets.' These tablets, of which the British Museum possesses many thousand specimens, have afforded us a wonderful insight into the daily life of the ancient Babylonians and Assyrians. They show us that legal proceedings were quite as complicated in days of antiquity as they are to-day; they give evidence of extensive commerical transactions in those days; and, while the lengthy inscriptions of the kings give us valuable information of the wars and campaigns, these little bricks tell us much of the ways and manners of the people.

The most interesting feature of the convention was the gathering, at the residence of President Gilman, of the university in the evening, which partook partly of the nature of a reception, and in part of an informal session of the association. Besides the members of the Oriental Society, a number of prominent gentlemen, including some of the trustees of the university, had been invited. President Gilman welcomed his guests in a few well-chosen remarks, where-