now published out of the total seventeen. The unfinished sheets cover the inland area of the state, along the lower Delaware. The arrangement of the map sheets was illustrated in *Science* (vii. No. 155). A map of the whole state, five inches to a mile, will form an eighteenth sheet.

— The fifth annual report of the U. S. geological survey, just issued, contains a number of valuable works by well-known authors, and is richly illustrated by excellent engravings. In addition to the papers already noticed, there is one by Prof. O. C. Marsh, on the gigantic mammals of the order Dinocerata, — an abstract of his volume on the same subject, already published, — and one by R. D. Irving, entitled "Preliminary paper on an investigation of the archaean formation of the north-western states," which contains the results of field and laboratory investigation of the problems of correlation, structure, and genesis.

— Professor Koch of Berlin is issuing a *Zeitschrift für hygiene*, for the publication of his own researches, which have hitherto been made public in the official documents of the imperial health office, as well as for the publication of the results of investigations undertaken under his direction in the Hygienic institute lately established in connection with the university.

— After many denials, it is again authoritatively announced that Professor Du Bois-Reymond is at work on a history of natural science in the nineteenth century.

— The strips of papyrus that were taken from an Egyptian excavation several years ago, and placed in the Berlin museum, are said to contain parts of the great work of Aristotle on administration, and, in particular, passages from the most valuable part of that work, — that treating of the civil administration of Athens.

— J. H. Darwin, son of the late Charles Darwin, is understood to have his father's biography nearly ready for publication. It is believed that the book will contain much of interest concerning the naturalist's domestic life. and his methods of carrying on his investigations and researches.

— At the last meeting of the Academy of political science, Columbia college, Hon. John Jay Knox, ex-comptroller of the treasury, read a valuable paper on 'Legal tender in the United States.' It is not improbable that Mr. Knox's paper will be published in an early number of the new *Political science quarterly.*

— The annual report of the Connecticut agricultural experiment-station, for 1885, deals almost wholly with analyses of feeding-stuffs and fertilizers. The laws of Connecticut require analyses to be made of all commercial fertilizers annually. The results of such, accomplished at this station in past years, have been of real value to the farmers and gardeners throughout the state. The larger part of the matter upon food-stuffs is compiled, though evidently useful. The original portion, however, is not inconsiderable. In these reports one is impressed with the almost purely chemical nature of the work accomplished; and the *personnel* of the station is composed wholly of chemists. While there can be no question of the great importance of agricultural chemistry, it certainly seems that the work of an agricultural experiment-station should not be so exclusively limited. One must think that a botanist and entomologist would be a desirable accession to the already able staff.

— Messrs. Romanoffski and Mushketoff have published a geological map of Russian Turkestan in six sheets, on a scale of 1 : 1,260,000. Besides surface geology, this chart shows the area occupied by ancient and modern glaciers, the location of mines, and the altitude of all important points.

— There have been received to date at this office the following subscriptions to the Heer memorial: Prof. Jules Marcou, five dollars; Prof. Asa Gray, five dollars; Mr. S. H. Scudder, five dollars.

— The next annual session of the National academy of sciences will be held in Washington, at the national museum, commencing Tuesday, April 20, at 11 A.M.

LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Certain questions relating to national endowment of research in this country, and their importance.

We have before us for our consideration at the present time, in this country, a number of questions of the highest import to science, of which it may be said that they are as yet in a formative stage. By this is meant, that the United States, as now representing one of the distinct nations of the world, has not yet expressed a national opinion upon them, after the manner usually adopted by nations for expressing opinions which may be said to be national, and which the nation stands willing to defend in opposition to the opinions of other peoples. Of the several questions that I refer to, none can claim greater weight than that one which takes into consideration the extent to which our government should endow scientific research.

This is really a point in political economy of the utmost importance, as it affects the national welfare, and has much to do with the formation of the national character. To those who have watched the growth. and approach towards a decision, of this issue during the past twenty-five years, the fact

must now be evident that we have arrived at that point when we must soon decide upon the attitude we are to assume in regard to it.

When all the elements of civilization have been in operation for over a century in a new country like ours, and when we come to study the final result, there is no better criterion of the success of that civilization than the relative number and the eminence of the leaders in the sciences, arts, and industries that it has produced.

We have many such leaders, and they must be regarded as the best fruits of our civilization; while their works, or the effects of their works, will always measure the degree of respect that we are held in by other nations.

To-day the problem which is contained in that chapter of political economy which deals with the question of the nation's placing to the best use these fruits of her civilization, is one of the highest importance, and is yet to be rigidly applied, for it is still tossed upon the waves of varying opinion created in the minds of men.

During the various stages of development of this principle in our country, the government at different times, and under different influences, has assumed an attitude towards it varying all the way from open hostility to the very verge of that method of treatment employed by King Frederick of Denmark, in the case of Tycho Brahe, three hundred years ago.

Aside from our great problems of education, there stands the equally vital question to us, which may be expressed in its broadest sense as the question of national endowment of research. This is one that naturally resolves itself into two general phases, which are quite distinct. The first is, taken in the light of a productive expenditure, to what extent should the government assist scientific researchers in private life; and, secondly, to what extent should she encourage it among those directly in the government employ.

Touching the first of these questions, I shall have but little to say; and such as it is, is mainly prompted by the aims and purposes of that act which has just passed the senate, known as the 'Blair educational bill.' This provides that the enormous sum of seventy-nine million dollars of money be appropriated from the national treasury for distribution among the states and territories "in that proportion which the whole number of persons in each, who, being of the age of ten years and over, cannot write, bears to the whole number of such persons in the United States." Now, this step not only presupposes that this country claims the right of voting away public means to such ends, but that she actually intends to act upon that supposition. In my own opinion, the nation does hold just such a right; but as well-meaning as the purposes of this bill are, in view of the excellent school advantages all over this country for all classes and conditions, would not the state be equally well served, if not better, by the treasury appropriating a similar sum to be used, by methods now well known to us, towards the development of an American Pasteur, or a Priestley, or another Agassiz, a Longfellow or a Fulton? Has any one any doubt as to which appropriation would advance the national and the people's interest the more? I believe the ends of all education are best met by the latter means of expenditure and endowment. I stand on the side of the king of Denmark, in his principle as applied to Tycho Brahe.

In taking up the remaining side of the question, — i.e., the extent to which the government should recognize and further the researches of those persons in her employ who have from time to time demonstrated their peculiar fitness to perform certain work, — I will, before discussing the subject, formulate a few well-known and established principles. These are as follows: —

1°. Both present and past history teaches us, that, in those rare instances where persons of high attainments, or even genius, have been enabled through government endowment to devote all their energies to their special line of investigation, the result has been of incalculable benefit to mankind for all time.

2°. That one of the inherent characteristics of the pursuit of knowledge is its inability to maintain itself commercially, and that, in all cases wherein the researcher is not financially provided for, it must of necessity be linked with some other occupation.

3°. That the published results of the labors of investigators are only of the highest standard and worth when the investigator has been enabled to pursue his researches with a mind absolutely relieved from pecuniary worry, and an absolute assurance of his being undisturbed, in any way, in the field of his investigations.

4°. That, to make actual progress in learning, the investigator must have the means at his disposal of thoroughly acquainting himself with every thing that has been previously made known by former workers through their published results; then any new facts he contributes in his special calling may be considered as contributions to knowledge.

Aided by these principles, let us now see what the government can effect with her bibliographers who are upon lighthouse duty, anatomists in recruiting officers, bacteriologists in charge of the library, pathologists as ordnance officers, and geologists in charge of the hospitals. There is no question but that the government possesses both the right and the power to apply any one of these distinguished gentlemen to demonstrate the first principle; and will any one question the gain that would follow, to knowledge, humanity, and the nation, by removing the bacteriologist from the library and placing him in the laboratory, where perhaps several thousand dollars' worth of instruments may be awaiting him?

The position of the majority of such scientists in the services fulfils the second principle; and, in any event, the government would have no trouble on that score, as she can retain in her service anyone as long as they please to remain.

It is equally evident that both of the last principles can be carried out by the government with the greatest ease, and without any additional outlay. The pay of any government officer is always sufficient to support him; and we all know that the government lacks neither opportunity, libraries, material, or the power of lifting from off the shoulders of her scientific workers all but the most necessary restraints. Of course, beyond the opportunities afforded by the national libraries, the fulfilment of the fourth principle remains entirely with the scientist himself.

Now, these exceedingly simple requirements are all that is necessary for this government to put into execution, in order to carry out and place in operation the grandest of all social schemes, the most powerful impulse to the progress of knowledge, and

the most complete realization of the ends of all education; yet how rarely is a step ever taken in the direction of putting into execution these four principles, and how often are they violated entirely!

Even to-day, as in years gone by, we find the scientist placed in charge of hospitals full of sick men, and with the lives of women and children in his hands besides, when he can see with his own eyes that every time he is called to attend, as physician, upon the sick, his very presence is detrimental to their recovery, while his painful attempts to demonstrate to those about him that he is trying to do his full duty, only results in total lack of confidence on the part of all the friends, relatives, and attendants, who draw a sigh of relief when he has left the room, and scrutinize his rather vague directions with suspicion.

The same applies to all the other incongruities that I cited above; and examples of every one of them for the last thirty years could and still can be found at any time represented in the government, and in most instances require a radical change, to say nothing of the benefits that would result to humanity for all time. R. W. SHUFELDT.

Fort Wingate, N. Mex., March 14.

The silver problem.

It is generally taken for granted in arguments on this and finance or money problems generally, that the state of business, industry, or economic prosperity, of the nations as they now exist, depends in a very large measure on the substance of which their money is made. Stagnation, crises, and all the baneful consequences thereof, are ascribed to the money system without any intelligent reason.

Money is any thing whose exchange value serves as a standard for measuring the exchange value of other things or of services. It follows that the best money is that whose exchange value is most fixed and unvarying. By a 'survival of the fittest' process, gold now has gained its place as the money best fitted for our present economic system; i. e., the exploitation or capitalistic system.

The customary blunder of the finance tinkers and thinkers is to ascribe the evil results of the present economic system to the money or finance department thereof. This they never do intelligently or clearly, and never can, because that relation does not exist: hence the confusion and general intellectual bankruptcy that prevails on this issue. In the prevailing capitalistic system, money and all other exchange values are permitted to become private property. The producers of exchange values have to give them over to a middleman (capitalist), who compels them to do that by the power of the state, which upholds him therein by upholding him as owner of the means of production. But the producers are by this process exploited (fleeced) by this third party. For example: a shoemaker and tailor would, if free to make their exchange directly, exchange, say, three pairs of shoes for two coats. But the middleman (capitalist) fleeces both by keeping for himself as much as he possibly can of the labor-products of both, without giving any thing in return. He gives the tailor in money the exchange value of only one pair of shoes in exchange for the two coats, and the shoemaker only the exchange value in money of one coat for the three pairs of shoes: consequently, by the hocus-pocus of the money system, he is 'in' one coat and two pairs of shoes. This right to be 'in' is his 'legal' or 'vested' right, — his 'profit.' The producers may deem it a 'vested wrong,' and a great many are beginning to think that way.

Besides being a 'shaving' system, it is also a 'competitive' system; that is, those workingmen get the 'prize,' work and wages, who will live in the meanest and cheapest manner; that is, who work for the lowest price, or, in other words, who will consume the least. The capitalist gets the prize, 'profit,' who has the most integrated and differentiated means of production along with the cheapest labor; that is, who can produce the quickest and most. On one side, the consuming power is decreased; on the other, the producing power is being increased; and in the middle both are fleeced. The result is this remarkably anomalous spectacle of people who are willing to work suffering from want because there is too much produced, and non-producers consuming enormously.

Herein, and not in the money department, is the real 'root of the evil.' Only a remedy that goes to this root, that is, in the root-sense of the word, *radical*, will cure the evil. This remedy is socialism.

CHAS. FIELD.

A swindler abroad again.

A person has been operating in Illinois and Iowa, representing himself to be Prof. H. S. Williams at some points, and Professor Oelrich at others; in all cases, so far as heard from, assuming to be connected with the faculty of Cornell university. His *modus operandi* is to borrow scientific works, money, and paleontological specimens, and contract with colleges to furnish series of fossils illustrative of American geology. He is an expert in classifying fossils, and his method of work is strongly suggestive of the individual who duped many scientific workers last year under the *alias* of Lesquereux. He has worked his games at Galesburg, Ill., Burlington, Mount Pleasant, Ottumwa, and Oskaloosa, Io., being at the latter place March 8 last. He is undersized, a man of from thirty to thirty-five years of age, light hair, beard, and mustache, and apparently having no use of his right arm, though this defect may have been simulated. H. D. CRAWFORD.

Ottumwa, Io., March 18.

Reports of the National academy of sciences.

From inquiries which I have received, there appears to be a general misunderstanding concerning the reports made by committees of the National academy of sciences. It is assumed by the public that these reports have been examined and approved by the academy, and therefore that they express the opinion of that body. This is a mistake. Generally a report is not submitted to the academy for discussion, and it must be understood to represent only the opinion of the committee who sign the report. An example will be found in a late report, published as senate document No. 67 (forty-ninth congress, first session), in which it is recommended to change the beginning of the astronomical day from noon to midnight. Probably a majority of the astronomers of the academy would oppose such a change if they were permitted to speak. ASAPH HALL.

March 18.