

It was necessary that the sunlight should look upon this prayer during the rest of the day; therefore every precaution was taken to protect the place from intrusion.

On Monday morning, with the consent of Wa-Wah, the prayer-plumes, and the earth containing them, were carefully dug up, without disturbing a feather (fig. 6), and deposited in the national museum, perhaps the most unique object ever placed among its precious collections.

This ceremony has been carefully studied among the Zúñis by Mr. Frank Cushing and Mrs. Stevenson, and among the Navajos by Dr. Washington Matthews, all of whom will give more detailed descriptions, with translations of the prayers, in the future reports of the Bureau of ethnology.

O. T. MASON.

U. S. national museum.

CAN ECONOMISTS AGREE UPON THE BASIS OF THEIR TEACHINGS?

ONE of the first and most obvious tests by which to determine whether men possess exact and reliable knowledge of a subject should be afforded by the agreement or disagreement of its recognized cultivators. I propose to show in the present paper that there is no sound reason why political economy should not favorably pass such a test. It is true that its cultivators differ both in the methods and objects of their studies. But such differences do not imply difference of views respecting either fundamental principles or conclusions.

Let us illustrate this by the case of physics. We have some writers and teachers of physics who prefer the experimental method. They teach principles by experiments, and lay little stress on mathematical deduction. Others teach the leading branches of the subject by mathematical reasoning, clothing their results in formulæ and theorems.

But these two classes of teachers do not stand in any antagonism to each other, nor accuse each other of ignorance. Each class recognizes the fact that there can be no diversity between correct theory and experimental results, and gives the other credit for aiming at truth in his own way. It is very clear to them that they are viewing and approaching the same subject from different points.

So, also, there are some economists who lay most stress upon the general principles of the science and the conclusions to be deductively obtained from them. Others prefer to lay stress upon the observed facts of society and business, showing the student how to work out such theories as may be founded on the facts he observes.

But it is an unpleasant fact that these two classes of teachers do not, like their brethren the physicists, mutually recognize each other as seeking and reaching valuable truths by different ways. Their attitude toward each other resembles that of the mediaeval philosophers more than that of the modern scientists. They divide themselves into 'schools,' each of which seems very unwilling to admit any truth in the system of the other. I hold that this state of things is a great drawback to the character and usefulness of economic science, and propose to inquire whether there is any necessity for its existence.

Since we must agree upon a common end, I shall assume such end to be the improvement of society, either by promoting such public measures and social movements as tend in that direction, or by discouraging and repressing those which tend to injure society. It is true that this is viewing the subject as an art and a policy rather than a science, and, in fact, taking a stand-point which detracts from its scientific dignity. But I am careful to say that this practical end is not the immediate subject which concerns us, but only the ultimate object which we may have in view.

Admitting, then, that a student desires to know what measures will benefit society, and what measures will injure it, how shall he proceed in acquiring that knowledge? I reply, he must be able to trace beneficial and injurious causes to their effects upon the social organism. If the knights of labor tell him that they want him to favor an eight-hour law, he wants to foresee what effect such a law will have on the interest of all concerned, — wage-workers, mechanics, men out of employment, and capitalists. So, also, when two opposing parties want him to vote for or against the coinage of silver, he cannot reach any intelligent conclusion unless he can foresee what effect free coinage or a cessation of coinage will have upon industry, commerce, and wealth. In a word, society being an extremely complicated and delicate organism, he must know what effects different causes may have upon it.

How shall he prepare himself for this great problem? I answer, that he must prepare himself as he would in the case of any other organism or machine: he must begin by understanding the anatomy and physiology of the social organism in its minutest details. Especially must he understand to what forces it is subjected, and what influence these forces have upon its workings.

Possibly we may here be met with the assertion that this is not a subject on which any exact knowledge can be acquired. There are respectable people, even teachers of economics, who seem to deny that they are dealing with a science. All

we can say in reply is, that this arises either from misapprehending what a science is, or from contemning the subject as unworthy of study. Science consists very largely in the establishment of exact relations between cause and effect, and a subject in which such a relation cannot be traced is unworthy of serious study as a science. In a word, if we admit that we can trace the relation of cause and effect, then we admit ourselves to be dealing with a science. If we do not admit this, then it is of no use to talk about questions of economic policy, and the safest course is to frown upon all social movements as productive of results which no man can foresee, and which are as likely to do harm as good.

The next question which arises is, how shall we proceed to acquire the necessary knowledge of society, — by purely deductive processes from general principles, or by the study of the facts as developed by history and statistics? I reply, we can attain no result except by a judicious combination of both processes. Some questions can be settled conclusively by common-sense deduction, while others are about matters of fact, and can be settled only by a study of facts. If a proposition were before the people of New York to withdraw water from the Croton Lake for industrial uses, and if the promoters of the scheme should publish an historical investigation of the phenomena of all aqueducts from the time of Caesar until now, to show that the withdrawal of the water would increase the available supply in New York, everybody would laugh at them. So in economics. No study of facts will tell us whether the number of houses available for a community will be increased or diminished by restricting the number of men who shall be allowed to learn the arts of carpentry and brick-laying, and by diminishing their hours of labor. But common sense settles the question at once.

If asked whether the most urgent want of the student is a knowledge of facts, or the practice of deduction and the study of deductive methods, I should reply that neither was urgent. What is really urgent is, that he shall know how to study facts effectively, and be able to understand principles rationally. The prevailing defect of the times is too much reliance on deduction, and too little understanding how to study the facts of the social organism, and how to apply principles to the study. What all economists should agree upon in their teaching, is to emphasize both the understanding of principles and the investigation of facts.

I have in my mind's eye two ideal men. The one has at his fingers' ends the state of commerce and trade the world over, knows the amount of

imports and exports of all nations, and has their laws of banking and currency learned off by heart, but, with all this knowledge, does not understand the laws of supply and demand, nor see any reason why there should be a relation between the imports and exports of a country. The other ideal man has a clear understanding of the laws of supply and demand, and all other abstract principles of economics, but is absolutely ignorant of the actual condition of trade and commerce in any part of the world. Which man is better equipped to answer an economic question? I reply, that, taking them as they stand, neither is well equipped. But the second man has this advantage over the first, — that, when the question is presented to him, he will know how to investigate it, and, with the aid of better informed men, will be able to find out the essential facts for himself; while the other man will never be able to make any really valuable use of his knowledge. Hence I prefer a system of instruction which is more concerned in teaching the student how to think and investigate, than in storing his mind with facts.

SIMON NEWCOMB.

GEOGRAPHICAL NOTES.

The Kongo. — The steam-launch *Peace*, belonging to the English missionaries on the Kongo, has been busily engaged, since her arrival on the river, in geographical work. Among the voyages made and reported by the Rev. G. Grenfell are a reconnaissance of the Kassai or Quango to longitude $17^{\circ} 30'$ East Greenwich. Another journey included a visit to the Lomami and Ikelemba, affluents of the left bank, and several others of the right bank, among them the Nkemfe, which proved narrow and tortuous. The Mobangi was navigable as far as explored; the Itimbiri also as far as the Lobi Falls, in $23^{\circ} 28'$ east longitude and $1^{\circ} 50'$ north latitude. At three or four miles from the junction of the Mburu with the Kongo, the former was found to divide into two branches, both barred by rapids or falls, the south branch having a cataract forty feet high. The Lomami is a fine river; but the current is very swift and the channel tortuous, so that the launch could make good but some six miles a day during the latter part of their stay upon it. In August of last year the Lulongo was ascended to a distance of nearly seven hundred miles. Its principal affluent is the Lopor, in $1^{\circ} 12'$ north latitude. Stanley's Black River, which enters the Kongo near the equator, is formed by the junction of the Juapa and Bosira. Hostile tribes forced the explorers to retreat after exploring the former some three hundred miles, when it was still navigable. The Bosira was only navigable for