batrachian had become, as was naturally expected, very much desiccated. It is very strange with what persistence such myths and fables retain their hold on popular credence. Men of high intelligence will aver their belief in petrified human bodies, and we have known a shrewd business-man to exhibit what he firmly believed was a large mass of fossil buffalo flesh, sinews, muscles, blood and all. What more natural thing could there be than the finding of a toad or bat, dead, hibernating or active, in the crevices of a coal-mine? and yet, doubtless, to one wholly unacquainted with geological and zoölogical principles, a carboniferous fossil fish or living bat seems equally inexplicable and wonderful. Such fanciful flights of imagination might pass unnoticed, were they not so industriously circulated in the columns of even the highest class of metropolitan newspapers.

THE COAST SURVEY AND THE NAVY.

THE latest argument for the transfer of the coast survey to the navy department is embodied in a paper by Lieutenant Dyer, U. S. N., recently published in the Proceedings of the U. S. naval institute. A very slight examination of this production shows that the author travels over an easy and well-trodden path instead of grappling with the real difficulties of the question. Nothing is easier than to demonstrate to the satisfaction of any writer who chooses to espouse the cause, that the coast survey ought to be turned over to the navy department. If nothing more were necessary than a "Be it enacted, etc., that the hydrographic work of the coast survey shall be transferred to the navy department," the problem would be a very simple one. It is to this simple form of it that all the arguments heretofore brought forward by the navy department have been directed.

Fault can be found with every system of public administration; and the thought, "How much better we could manage things if congress would put us in charge of them!" will be prevalent so long as human nature remains as it is. The real difficulties of the question begin when we attempt to decide just what work, what records, and what appliances shall be transferred to the navy department, and how the navy department shall utilize the appliances and carry on the work. One difficulty met with at the very start is found in that custom of the naval service which requires that almost every officer, certainly every young and energetic officer, shall change his duty at the end of every three years. Howsoever well a cadet at Annapolis may be trained in the theory of marine surveying, he cannot possibly acquire at the academy that experience in practical work of any kind which is necessary to its effective prosecution. His first year, perhaps his first two years, in the work of the survey, would be very largely taken up in learning how to do it, so that he would hardly have become an expert before he must leave to keep watch on board a ship of war. Of course, we refer here to the more difficult and technical work of chart-construction, and not to such matters as running a line of soundings. It would therefore be a necessity of the service that a permanent corps of skilled map-makers should be organized, or that a part of the existing corps should be transferred. Even then it would be contrary to naval custom to allow these civilian assistants to hold any other than subordinate positions; and all branches of the direction, from the head of the office down, would be intrusted to men who were continually changing.

This is a consideration which would have to be kept in view in deciding what work should be transferred. One important function of the survey is the study of the effect of tidal and other action upon harbors. We all know that most of our harbors are in a continual state of change; and the study of the causes of such changes can be effectively prosecuted only by experts who make it a considerable part of the business of their lives. Can the navy be relied upon to furnish such experts? Tidal observations at numerous points along the coast form an essential part of the work. Will they be effectively kept up under the continual changes of naval administration? Can the records of the coast survey which pertain to hydrography be separated from the others and transferred to another department without any inconvenience? If not, can the navy department get along without them, and not waste labor in repeating work already done? Can a portion of the draughtsmen and engravers be transferred, or must new men be employed in their places?

We suggest these questions, not claiming that their solution presents insurmountable difficulties, but only as showing where discussions should be directed in order to be effective. Such general considerations as Secretary Chandler and the naval officers have presented on the subject may be very

effective in starting people to think about it, but can never suffice to show what policy should be adopted. To demonstrate what ought to be done is one thing; but to show how to do it is, as all practical men know, a very different and generally a much more difficult thing. We hope, therefore, that if our naval friends, for whose professional ability *Science* entertains the highest respect, really desire the transfer, they will present such a detailed plan of proceeding from beginning to end, that every one shall be able to understand and criticise it. Until they do this, they must not expect to excite congress to action.

We may add one general consideration. A considerable number of naval officers are actually engaged in coast-survey work. Is not their work as effectively performed under the present system as it would be if the navy department had charge of it? What would the officers themselves, or the navy at large, gain by the transfer? We are aware that Secretary Chandler considered it a very great hardship that officers should be removed from the immediate control of the department to which they belong. But where does the real evil come in? These questions must be answered, and the public benefit to be gained by the change must be made clear, before the project can receive the really effective support of scientific men. The latter are not disposed to prejudge the question, but before supporting the measure they want to be satisfied of its practical advisability; and this can be done only by the advocates of the change fully considering such questions as those above suggested.

COMPOSITE PORTRAITS OF AMERICAN INDIANS.

ON the plate accompanying this number is given, so far as known, the first presentation of composite portraits taken of North American Indians.

No. 1 is of three full-blood Dakota or Sioux young women belonging to the band commonly known as the Brulé, and living at the Crow Creek agency, Dakota territory. Their ages range from nineteen to twenty-three years. Their average height is five feet six inches and a half; their average weight, a hundred and forty-one pounds. This composite is made from photographs taken on the same day and in rapid succession. On the same afternoon, composite No. 2 was taken from the same persons, each one sitting her allotted seconds before the camera. In No. 1 and No. 2 the order of the faces is identical, and care was exercised to try and procure similar results in the portrait; but, as will be observed, the composites are different. The controlling face in No. 1 is given in picture No. 3, which was the first photograph to be exposed in making up composite No. 1. The dominant face in No. 2 is given in picture No. 4. It belonged to the last sitter, and her photograph was the last one exposed in making composite No. 1. In two composites similarly made, of Omaha women, the one from sitters varies in a like manner from the one made up from photographs, only in a different order. In the one from life the broad face of the last sitter controls the composite, and in the other the long face of the first photograph influences the picture. This variation of composites made from the same faces — one taken from life, the other from photographs — is mentioned for what it may be worth.

A composite of Omaha men, a cognate tribe, differs but little from a Dakota composite, except in the eyes. In the Omaha composite the eyes are larger and fuller. The height and breadth of head, the strong but not unduly heavy lower face, are noticeable in both Omahas and Dakotas. A composite of Omaha women does not differ in any marked manner from the Dakota portrait. In both the pictures of the women, there is to be observed a similar variation between the female and the male of the same tribe, notably in the shape of the head, and the greater prominence, proportionally, of the cheek-bones in the women's faces.

It is premature to judge of the value of composite portraits. They are certainly curious and interesting, and many points will occur to the observer of these Indian faces. In a general way, they seem to confirm the results of a close study of the home-life and the various customs, including the most savage rites of war and religion, made by the writer among this family of Indian tribes, by showing them to be a people, intellectual rather than brutal, unawakened rather than degraded. The portraits indicate the stamp of tribal fixity, and reveal the unconsciousness within the individual of the analytical powers of mind by which man masters nature, — a peculiarity which is the key to much in Indian sociology and religion.

The writer is indebted to Mr. Jenness Richardson of Washington, D.C., for the making of the composites.

ALICE C. FLETCHER.

GEOGRAPHICAL NOTES.

Siberian trade-routes. — The practical failure of the route by sea has stimulated the search for routes of inland communication between Russia and Siberia. The latest investigations are those be-