

brating ship the lag of the instrument is much reduced.

All of the above applies with even more force to airships. Deflective influence will modify the course not only in a horizontal but also in a vertical plane. Professor Marvin has shown that when a machine is climbing with given power, the ascent will be more rapid if made clockwise than when counterclockwise; this of course for the northern hemisphere, and conversely in the southern. So the aviator must watch his barometer not less than his compass. With him it is all important that true static pressures be recorded; and at least he should be keenly alive to the importance of the corrections to be applied, most of them functions of speed. When an aneroid is moving at 45 m/s (100 miles an hour) not an unusual speed, he may be called upon to add to or subtract from his proper speed, the air speed, say 25 m/s., also the earth's angular velocity.

The exposure of the barograph is important. The containing box must have an opening either facing the wind or away from it: if the former, the pressure shown is aerostatic plus aerodynamic. Zahm and others have discussed pressure distribution around a steam-like body and J. G. Coffin has actually designed and used a container that rotates periodically. He found that when the aperture was 45° either side of the head-on position the observed pressure was normal or true static.

From all the above, it is evident that hereafter in the charting and discussion of storm centers at sea, as based on pressure readings, we must know *whether the ships were headed east or west, the angle of inclination of the ship to the wind, the speed of the ship and the speed, direction and gustiness of the wind.*

ALEXANDER McADIE

BLUE HILL OBSERVATORY,  
January 20, 1920

#### STATE REWARDS FOR MEDICAL DISCOVERIES

A REPORT has been issued by a joint committee of the British Medical Association and

of the British Science Guild, which has been considering the question of awards for medical discoveries. According to the abstract in the *Journal* of the American Medical Association the committee defines medical discoveries as being: (1) the ascertainment of new facts or theorems bearing on the human body in health and on the nature, prevention, cure or mitigation of injuries and diseases; (2) the invention of new methods or instruments for the improvement of sanitary, medical and surgical practise, or of scientific and pathologic work. The reasons given for rewarding medical discoveries are the encouragement of medical investigation and the discharge of a moral obligation incurred by the public for its use of private effort. The various public types of rewards are cited as: titles and honors given by the state, by universities and other public bodies; prizes and medals; patents; promotion and appointments; pecuniary rewards by the state. Concerning the general principle of assessment, the committee hold that, in the interests of the public, all medical discoveries should if possible receive some kind of acknowledgment or recompense. But in view of the variable conditions, nature and effects of particular investigations, it will often be difficult to assess the kind of recompense suitable. In the first place, a distinction should be drawn between compensation and reward. By compensation is meant an act of justice done to reimburse losses; by reward an act of grace in appreciation of services. The following different cases should be considered: A. Discoveries involving pecuniary or other loss either by direct monetary sacrifice or by expenditure of time, or by diminution of professional practise, without corresponding pecuniary gains. An example is that of Jenner, who occupied himself so closely with the investigation of vaccination that he lost most of his medical practise and also a considerable sum in expenses. This was fully acknowledged by Parliament, which granted him \$150,000. B. Discoveries that have increased the professional emoluments of the investigator by enhanced practise or other means.

Such are frequently improvements in surgical operations or medical treatment, which leads to increased practise. Another case is that of serums, etc., which may have been protected and put on the market. Here compensation can not be demanded, and pecuniary rewards are generally unnecessary. On the other hand, honors are often and justly bestowed for such work. C. Discoveries that involve neither gain nor loss to the investigator. This class includes most of the good and sometimes great clinical, pathologic and sanitary discoveries. Here also compensation can scarcely be demanded, and honors are already often given, but pecuniary awards should sometimes be bestowed as an act of grace when the value of a discovery greatly exceeds the emoluments of the investigator. This principle should hold even for men who are directly paid for undertaking the research, especially when such payment is (as usual) small and the discovery great. Special attention is drawn to: (1) men who have refused lucrative posts to complete researches; (2) men who have refused to protect their work for fear of limiting its application, and (3) men who have carried out investigations for governments for little or no payment, on patriotic grounds.

In the public interest, the committee insists on these principles: (1) No medical discovery should be allowed to entail financial loss on him who has made it. (2) Compensation or reward should be assessed as equal to the difference between the emoluments actually received and those which a successful clinician might have received in the same time. Additional reasons for this are that few medical discoveries are patentable, and they seldom give good grounds for promotion or for administrative appointments in the public services. Whether a particular discovery shall receive large or small assessment will depend, in addition, on these considerations: (1) Width of application. For example, the work of many of the older anatomists, physiologists, and parasitologists, of Pasteur and of investigators of immunity, have affected most recent

discoveries. Discoveries on widespread diseases, such as the work of Lister, Laveran or Koch, are often more important than those on more limited maladies. (2) Difficulty of the work done. The solution of a difficult problem requires more study and also more time and cost, and therefore deserves more recompense than a chance observation. (3) Immediate practical utility. A strong plea can be made for state remuneration in cases of this kind unless they come under Class B. Curiously, they never receive it, and academic recognition is also often not forthcoming. (4) Scientific importance. Discoveries not of practical utility may become so at any moment and should be included in the scheme if sound and of wide application.

During the last few years, the British government has disbursed an annual grant of about \$300,000, under the Medical Research Committee, for subsidizing investigations authorized by the committee and carried on by workers selected by it. This grant does not remunerate discoveries already made, but proceeds on the principle of payment for prospective benefits.

## SPECIAL ARTICLES

### A POCONO BRACHIOPOD FAUNA

THE Pocono formation of the Appalachian Mississippian measures is known to contain marine fossils in places but little has been published on the subject and the information is scattered and difficult to assemble. The writer has recently found two beds of sandstone in the Pocono Series on Laurel Mountain in Tucker county, West Virginia, which contain brachiopod impressions and has assembled the following list of occurrences of fossils in strata which are considered to be of Pocono age. Since the present note is written in the field, full descriptions of these localities and complete citations to the literature are not given.

#### POCONO FAUNAL LOCALITIES

1. At Altamont, Maryland, on the western limb of the Georges Creek-Potomac Syn-