has spent months of labor in piecing and articulating the skeleton; and to the equally skilled field man who spent months in the bad-lands searching for it, and when found knew how to bring it all in in such condition that it could be reconstructed by the preparator. Who is to decide what meed of credit belongs in each instance to each man? And how about the great foundation or the generous donor whose money has paid for all this work? Most important contributions to science nowadays are composite work, of which the author's contribution is often only a minor part. Yet we continue to apply to them standards of professional ethics derived from a time when most research contributions were from start to finish the work of the author, usually on his spare time; and any minor aid from others was acknowledged.

All this discussion of credit omits the really important and essential reason why an author's name is attached to a published contribution or illustration. He is the party responsible for the statements, results and conclusions therein. That is the point with which the reader of the article is chiefly concerned. Scientific publications are printed and distributed primarily for the benefit of the reader, not to enhance the reputation of the writer. We are all apt to forget that, being all egoists in varying degree, but it is nevertheless true and should be kept in mind in discussing professional ethics. What concerns me when I am reading a scientific paper is how far I should accept its statements and conclusions, whose authority lies back of its illustrations—who is responsible. I don't care who made the drawings, so that they are certified as accurate by a reliable authority. Nor do I care who collected or prepared the specimens, so that my authority is responsible for stratigraphic and collecting data and reconstruction. As a side issue and a matter of personal acquaintance with the men concerned, these points may be of interest. But my prime concern is to get hold of as much authoritative, well-expressed information as possible in the field covered, and to size up just how far I can trust in its accuracy and thoroughness.

This I take it is the practical reason why an article or illustration in a scientific journal should be, as it usually is, credited to author A, even though most of the work was done by assistants B and C, artist D, preparator E and collectors F, G and so on. In an art magazine the artist would naturally be cited as author of the illustrations, as the reader would care very little about the scientific soundness. In a popular book or magazine they would usually be credited to the collaborator who had the biggest newspaper reputation. The late Mr. Carnegie is presenting a Diplodocus to Mexico. That is the aspect of the transaction that interests the public. But the Mexican scientist who studies that reconstruction regards Dr. Holland as his authority for its accuracy. I see no more reason why Professor Berry in copying a restoration of *Diatryma* should credit it to the artist instead of the authors than for the text-book in which it appears to be called McGraw-Hill's "Paleontology" instead of Berry's.

As to the "customary acknowledgments" in a scientific article, they may relieve the conscience of the author, but does any one really suppose that a line or two in the introduction which nobody reads does justice to the part played by a collaborator who often has contributed much more work than the author and sometimes more brains? His real profit lies in the fact that he has got his work and his ideas on record, accessible to all who are interested. That is what we all profess to be working for in scientific research. If personal credit is all that concerns us, let us drop the hypocrisy of pretending otherwise, or claiming that the world owes any special recognition or reward to our "unselfish efforts."

W. D. MATTHEW

UNIVERSITY OF CALIFORNIA

GENETICS

I HAVE just received the third edition of Walter's "Genetics," of which it may be said that it is well written, comprehensive and essentially up to date. But it seems to me to start out with an extraordinary confusion of ideas. A diagram represents "the triangle of life," the three sides being heritage, environment and response. It is said that when this idea is applied to man, "there are theoretically at least a minimum of twenty-seven possible kinds of human beings, as shown in Fig. 2." Fig. 2 shows "The scale of success. A stands for high grade; M for mediocrity; Z for low grade." These grades are assumed to exist in respect to each side of the triangle, and to vary independently. Thus No. 4 has first-class heredity and environment, but exhibits Z response or conduct. No. 25 has Z heredity and environment but A conduct. Now it is certainly true that the springs of human personality are far too subtle to be completely "explained" in scientific terms, but from any point of view, the exhibit in Fig. 2 is contrary to reason and experience. Further confusion of ideas is shown in the definition: "Response, on the other hand, represents what the individual *does* with his heritage and environment. It is what may be described as the training or educational factor, most clearly demonstrable in the higher animal forms."

The book also reminds us of a serious dilemma which confronts teachers of genetics, or indeed of scientific subjects in general. The subject-matter has

grown enormously in recent times, and when the resulting complexities are presented in a text-book, the necessary consequence is that more and more this takes on the form of an encyclopedia or dictionary. Yet it can not be said that any of the items are unimportant. It seems to me that from a pedagogical standpoint we shall be compelled, in beginning courses, to eliminate many of the topics, and treat the rest more fully and interestingly. By so doing we may create an enthusiasm for the subject and produce a far more permanent impression than is derived from a multitude of half-understood facts memorized for the examination.

T. D. A. COCKERELL
UNIVERSITY OF COLORADO

MALFORMED LEG BONES IN YOUNG CHICKENS

A CONDITION in young growing chickens referred to by different ones as leg weakness, rickets, enlarged hock joints, slipped tendons and malformed leg bones has become serious in many sections of the country. The condition is aggravated by intensive methods of production such as confinement in small runways and storage brooders where exercise is limited.

This deformity differs from rickets since it develops in the presence of vitamin D and a well-balanced mineral mixture. Between the ages of three and six weeks the hock becomes enlarged, probably on account of edema and slight hemorrhages usually found in the tissue surrounding the joints. The gastrocnemius or main tendon which extends the foot and flexes the leg occasionally slips from the condiles which hold it in place. This may be responsible for the stiffening and malposition of the leg below the hock joint as found in advanced cases. Either or both the femur and tibia may become enlarged or develop marked curvature and one or both legs may be involved. The legs may bow out, curve in or take on other unusual shapes.

The number of chicks affected in a flock has been observed to vary from 1 to 60 per cent. The trouble has not been confined to any group of conditions. It may be found in both slow and rapidly growing chicks, with all-mash or with grain and mash rations, on wire and board bottom runways and with high and low mineral content in the rations.

The departments of poultry husbandry, chemistry and pathology at the Kansas Agricultural Experiment Station are now working together in a cooperative experiment to find if possible the cause of this trouble.

LOYAL F. PAYNE
KANSAS STATE AGRICULTURAL COLLEGE

QUOTATIONS

ELMER A. SPERRY

"THE lot of every one of us," wrote Horace, "is tossing about in the urn, destined sooner or later to come forth and place us in Charon's boat for everlasting exile." This time the lot has come forth for one whose going the whole planet will regret. A passenger on the high seas, remembering the fate of Palinurus, wrote of this great inventor whose mechanical helmsman, called familiarly the "Metal Mike," now guides great ships to their desired havens:

> Now is old Palinurus' occupation gone;
> It has been taken o'er by one named Sperry
> Who has installed a "Metal Mike" instead—
> He'll soon be putting one on Charon's ferry.

Unhappily for us who still remain this side the River of Woe, Mr. Sperry has gone to his "aeturnum exsilium," but he has left among men an everlasting fame, and imagination allows one to think of his inventive spirit making suggestions to the ferryman about improving service in the crossing for the benefit of those who have to take it later. For Mr. Sperry was ever thinking of how he might make the dwellers on earth a little more at ease whether on sea or land or in the air. For those who travel by sea he provided not only the pilot, who whatever betides holds his rudder true, but also a "stabilizer" to prevent the rolling of the ship and a device for signaling to prevent collisions. For those who travel by air he has helped to maintain the equilibrium of their planes and to lessen the peril of fire and to penetrate the fog. Towards the end of his long series of inventions he perfected an instrument for detecting the slightest imperfection in a steel rail.

What his born genius for invention would have done for a slower-going civilization one cannot imagine, so closely has it been associated with the swifter agents of this mobile age. He would have been put among the Titans in the ancient Greek age. But with all his seemingly miraculous achievements, he who harnessed the motion of the earth to do his bidding was a gentle human being, generous in his sympathies and beloved in his own person. America, claiming him for her own and proud of his contributions, which were recognized by the highest honor bestowed by his own profession in his own country, remembers with special satisfaction that he was acclaimed by his fellow-engineers of the world, when he presided at the International Congress of Electrical Engineers in Japan last year.—*The New York Times.*