tive geometry in Iowa State University, instructor in drawing and descriptive geometry; Mr. M. G. Edwards, graduate student in the University of Wisconsin, instructor in geology and mineralogy; Mr. T. D. Bains, Jr., a practical mining operator in California, instructor in mining engineering. The salaries of the full professors in Case School of Applied Science have been raised to $3,500.

PROFESSOR PERRY B. PERKINS has been called to the chair of mechanics at Brown University.

DR. M. O. TRIPP has been appointed professor of mathematics at Olivet College.

DR. JOHN B. LEATHES, professor of pathological chemistry in the University of Toronto, leaves Toronto in December for Sheffield, England, where he has been appointed professor of physiology in the University of Sheffield.

DR. A. W. STEWART, lecturer in organic chemistry in the Queen's University of Belfast, and formerly lecturer in stereochemistry at the University College, London, has been appointed lecturer in physical chemistry at the University of Glasgow, in succession to Professor Soddy, now of Aberdeen.

DR. D. WATERSTON, professor of anatomy in King's College, London, has been appointed to succeed Professor J. Musgrove as Bute professor of anatomy in the University of St. Andrews.

DISCUSSION AND CORRESPONDENCE

DR. BATESON'S PRESIDENTIAL ADDRESS

TO THE EDITOR OF SCIENCE: If a more extraordinary example of the inverted pyramid in reasoning than is comprised in the two Australian addresses by Bateson, lately published in SCIENCE, has ever been offered to a scientific audience I have never seen it. Offered as these were chiefly to a lay audience they are incomprehensible as coming from a man who has reached the presidency of the British Association.

We may admit the value of the Mendelian discovery in its relation to low and relatively simple organisms like plants, and also that in higher organisms Mendelian effects can sometimes be traced, but that unbridled hypothesis should be permitted to cover our colossal ignorance is not what we expect from such a source. When the observed facts flatly contradict a hypothesis a truly scientific expositor says "I can not account for it," and does not cover up (to the lay mind) his ignorance by the phrase of "an inhibiting factor." What is an "inhibiting factor?" Nobody knows. When the Mendelian law proves to fail utterly, as in the notorious case of the mulatto, the assumption of "excessive segregation" means nothing but "I do not know."

Any case can be "proved," by such methods but they are not scientific.

When a train is not on time it is doubtless due to "an inhibiting factor," but that explanation will hardly satisfy an impatient man who is anxious to be off, nor a railway manager seeking efficiency in his railway work.

If we assume the origin of life in a simple ameboid organism, without a soma, and the development of a rudimentary soma through natural selection, as a protection against the direct impact of the environment; and then the gradual complexity of the somatic envelope until it reaches its present grade in the higher vertebrates, what is the relation of the "germ-plasm" to the soma?

We may tolerate the theory of the continuity of the germ-plasm because it seems to fit the known facts. If it had never acquired a somatic envelope there would be nothing but ameboid organisms to this day. But to what does the germ-plasm as carried by the present generation of animal life owe its existence? Its potentiality of cell-division depends for continuity upon the nutrition furnished by the soma. Is it creditable that in hundreds of millions of evolving generations the constantly renewed germ-plasm should remain unmodified and that in an ameba there should exist unawakened the factors for hair, teeth, bones and hoofs? The idea seems to the writer preposterous. If the plasma has not changed its characters and potentialities since the ameboid epoch, why should there be anything now but amebas? If through the slow

modification of the soma the potentialities of the germ-plasm have been added to and modified, then the dispute as to the inheritance of acquired characters is a futile logomachy.

The original somatic envelope must have been derived from the original plasma. Why then should their mutual potentialities be denied?

WM. H. DALL

September 8, 1914

HEREDITY AND MENTAL TRAITS

TO THE EDITOR OF SCIENCE: In the admirable address of Professor William Bateson[1] surveying the bearing of modern views of heredity upon psychological and social problems, one admires particularly the staunch presentation of a consistent scheme of inherited traits and the readiness to apply them to a biological view of the social forces in whose intimate workings we have acquired so minute an interest. The same applies to the qualities of mind, of which alone I shall speak. One characteristic utterance is the following:

> I have confidence that the artistic gifts of mankind will prove to be due not to something added to the make-up of an ordinary man, but to the absence of factors which in the normal person inhibit the development of these gifts. They are almost beyond doubt to be looked upon as *releases* of powers normally suppressed. The instrument is there, but is "stopped down."

A very differently characteristic expression occurs in comment upon the opinion of Tom Paine inveighing against the notion of hereditary political institutions, which he regards as equally absurd as a "hereditary wise man" or a "hereditary mathematician."

> We on the contrary would feel it something of a puzzle if two parents, both mathematically gifted, had any children *not* mathematicians.

The point which I wish to raise interrogatively rather than critically is this: How far have the holders of such views—for there are many similar expressions in the recent literature—considered the problem of the assumptive nature of the unit of mental expression which is involved in such concepts as "artistic gift," "mathematically gifted?" Take the last of the expressions, and put the matter in extreme form: Suppose both parents to have specialized on quaternions, would one expect the children also to be quaternionists? Would it answer the biological requirement if the children showed ability in physics? in engineering? in science in general of any quantitative form? in a facility for abstract thought, say philosophical or economic? in a taste for study and an intellectual type of mind? Where shall we stop in considering that the trait in the child is of the same nature as the trait in the parents? We seemingly expect that the children of musicians will be musical and not the one a painter and the other a musician; on what is that expectation based, biologically considered? In brief it seems impossible to discuss mental heredity without coming to some understanding of its evidences and the modes of its expression. The equation is defective without a specific reference to the meaning of both sets of terms. Quite probably the definition is beset with large uncertainties; but it seems to a psychologist that the writers upon heredity, in applying their principles to mental traits, are in duty bound to bring the conception of a mental trait within the scheme of their considerations.

Similarly one asks in the same spirit of seeking information, why artistic gifts are in the nature of a *release* of powers which everybody has but few show, and why are mathematical gifts not of the same description? Is it the sensory dependence of the musical gift that places it in one category, which is a different category from that of the mathematical gift? And fundamentally is there such a thing as either? If so is there also a gift for steam-engineering? and why not? And what would have become of one of similar brain inheritance if he happened to be born before the days of steam? The reduction ad absurdum lies near at hand. The moral is simple. It enforces that the application of principles of heredity to mental traits can not go farther and go consistently until a reasonable understanding is reached of the probable nature of a unit of mental trait and of the equivalent forms of its possible expressions.

[1] SCIENCE, September 4, 1914.