attributes to me, and which he describes as a "metaphysical" teleology—the idea of "an ultimate design pervading all nature, and blending into one harmonious Cosmos the combination and co-ordination of physical causes."

The first of these arguments from design he says he has a right to contest in your columns and to represent as "subverted" by Mr. Darwin: whilst as regards the second of these arguments from design, he admits the truth of my position that "no possible amount of discovery concerning the physical causes of phenomena can affect it."

I am not able to accept this distinction, or to withdraw on the strength of it my protest against the original communication of Mr. Romanes. The distinction is, in my opinion, purely imaginary and fallacious. The fundamental proposition of all arguments from design is simply this: that the exquisite adaptations to special ends which are conspicuous in organic nature are, and can only be, the work of physical forces when these are under the combination and direction and control of Mind.

But the whole force of this general proposition, and the whole power of it to produce conviction, depends on its applicability to particular cases of adaptation. There may be, and there are in nature, a few cases of apparent adaptations and of orderly arrangements of a very simple kind which do not necessarily suggest Mental Purpose. They may be the effect of what we call accident, or of the action of elementary laws under no guidance or direction. Inorganic phenomena furnish many examples of such arrangements. Even among organic things there may be a few examples of them. But in the special and elaborate adaptations of organic structures to their particular work and function, the human mind recognises the operation of mental faculties having a fundamental analogy with its own. Mind is a known agency, producing well-known effects. These effects can be recognised with as much certainty as the effects of any material force acting by itself. The Argument from Design is founded on this recognition. The writers of the last generation were perfectly right in resting the general Argument from Design on the separate instances of adaptation in which the mark of Mind is most signal and conspicuous. I hold, as they held, that each particular instance of adaptation which cannot be due to chance, and which cannot be due to the uncombined action of elementary forces, is "a separate piece of evidence pointing to operations of special design."

Mr. Darwin's theory of Natural Selection no more touches this argument than his hand could touch the fixed stars.

When Sir Charles Bell wrote his beautiful and classical Treatise on the Hand, he knew that the hand of every individual man has been "developed" in the womb. He knew that in the course of that development it passed through many successive stages. He knew that the vital processes concerned in this development were organic processes forming part of "natural law." But it never occurred to him to imagine that the "law" under which such intricate and wonderful adaptations were reached was a "law" in which Design had no part, or over which Mental Purpose had no control. He saw in physical causation the instrument of Mental Purpose, and not its rival or its enemy. He knew, moreover, the close relations between the hand of man and the less perfect, but the equally adapted structures of the same limb in the lower animals. He knew, farther, that the theory of Evolution had been started, and that just as individuals were born and grew, so it was suggested that all Animal forms had been born of each other, and that the Human Hand was the result of a long gestation in the womb of Time. He alludes to these theories and sets them aside—not as being untrue, but as being immaterial to his argument. And he was right.

Mr. Romanes is much mistaken if he supposes that the present generation is satisfied with the purely materialistic explanations of adapted structures which are erroneously supposed to be the final result of Mr. Darwin's theory. So thoroughly dissatisfied, on the contrary, with these explanations is the mind of the present generation, that it is breaking out in revolt against them along all the line. The old school of Theism is as alive as ever, and is as ready as ever to appropriate every new fact into the structure of its well-worn defences. And outside this school—among men who reject Christianity altogether, and who sit loose from every known theology—a conviction has arisen that somehow—by whatever name it may be called—Mind is indeed "immanent" in nature, working everywhere with an awful and an abiding Presence.

This view has been supported of late in Germany in a powerful argument by an author whose philosophy may seem grotesque, but who certainly has at his command all the resources of scientific knowledge, and who accepts and incorporates every fact which has been established in the whole field of biological investigation.

I wish Mr. Darwin's disciples would imitate a little of the dignified reticence of their master. He walks with a patient and a stately step along the paths of conscientious observation. No fact is too minute—no generalisation is too bold. But for the most part the whole is kept well within the limits, actual or supposed, of physical causation, and the rash dogmatism on higher questions of Philosophy and Theology which are common among his more fanatical disciples, are "conspicuous by their absence" in his writings.

ARGYLL

IT will be instructive to many, I doubt not, as to myself, to receive from Mr. Romanes an explanation of the precise sense which he attaches to the phrase "a general law whose operation is presumably competent to produce" any set of phenomena.

No one is more desirous than I am to see science freed from all theological complications; and it seems to me that every one who speaks of laws as "governing," "controlling," "regulating," or "producing" phenomena, is really mixing up ideas belonging to two entirely distinct categories.

That in the *purely scientific* sense, a "law of Nature" is nothing more than a general expression of a certain set of uniformities which the intellect of man discerns in the surrounding universe—that such a law holds good just so far as it has been verified, and not necessarily any further—that it accounts for nothing, and explains nothing—and that the power of prediction which it is supposed to give, depends entirely on an *assumption* of its universality, which may or may not be justified by facts—was the teaching of the great masters (Herschel, Whewell, and Baden-Powell), who aimed to form correct habits of thought among what half a century ago was the "rising generation" of scientific men. And as all subsequent writers on the logic of science, from J. S. Mill to W. Stanley Jevons, have taken the same view, I venture to think that it rests with Mr. Romanes to show that there is anything in the *law* of Natural Selection (which is simply the generalised expression of the *fact* of "the survival of the fittest"), that places it in a different category from every other.

The whole series of expressions to which I have taken exception may be regarded either as a "survival" of the theological conceptions by which science was formerly dominated, or as the result of a very common confusion between a "law" of science and a "law" of a state. For a "law" can only "govern," "control," "regulate," "produce," or exert any kind of *coercive* agency, when there is a power to give it effect; the "law," in that sense, being simply the expression of the will of such governing power, divine or human, as the case may be.

But as science (and in this I am quite at one with Mr. Romanes) knows nothing of such "metaphysical" conceptions, I cannot but think that it would be much better that scientific language should be cleared from expressions that have no meaning at all, if it be not one based upon them.

If I have not made my meaning sufficiently clear, I may refer any one who wishes to see this matter more fully discussed to my paper on "Nature and Law," in the *Modern Review* for October, 1880.

WILLIAM B. CARPENTER

56, Regent's Park Road, N.W., October 29

P.S.—I regret that my reference to what Mr. Simon (in his address on Public Medicine at the International Medical Congress) designated as "the very remarkable series of facts" adduced by Dr. Creighton in support of his view of the communicability of bovine tuberculosis to man through the medium of milk, should have been so worded as to make it appear that Dr. Creighton accepts the doctrine of Klebs as to the "micrococcus" origin of tubercle, his dissent from which he had explicitly recorded. As Mr. Simon spoke of Klebs' doctrine as having been "solidly settled and widely extended" by the recent researches of Schüller, and as Dr. Creighton's difficulty of conceiving "a neutral (?) living organism" to be "charged with the power of conveying complex details of form and tructure from one body to another," affords no *dis*proof of it, there seemed to me no occasion, in writing for the general public, to take any special notice of a point which Mr. Simon, in addressing a professional audience, had thought it better to pass without mention.—W. B. C.