often without change in action, characterizes controlling units, it is not surprising that *Dt* units are present in unrelated strains of maize, and that their locations in the chromosome complement differ. As further methods are devised to detect controlling units, it is anticipated that more of them will be discovered.

If we had thermometers sufficiently delicate, it is probable that we might acquire, by similar means, information still more interesting, with respect to the rays of invisible heat discovered by Dr. HERSCHEL; but at present there is great reason to doubt of the practicability of such an experiment.

From this overlook we see dynamic equilibria on an immense scale, determining much of the course of evolution by their self-perpetuating fluctuations. This is a novel way of looking at the world, one with which I am not yet comfortable. But I have not yet found evidence against it, and it does make visible new paths and it may even approach reality.

Seeing that a great number of biological phenomena are characteristic of *associations* of species, it is to be hoped that this theory may receive further verification and may be of some use to biologists.

The genotype-conception here advocated does not pretend to give a true or full "explanation" of heredity, but may be regarded only as an implement for further critical research, an implement that in its turn may be proved to be insufficient, unilateral and even erroneous—as all working-hypotheses may some time show themselves to be. But as yet it seems to be the most prosperous leading idea in genetics.

Although such studies have suggested that modern human lineages derive from Africa, many important questions regarding human origins remain unanswered, and more analyses using detailed SNP maps will be needed to settle these controversies.

In this third Book I have only begun the Analyſis of what remains to be diſcover'd about Light and its Effects upon the Frame of Nature, hinting ſeveral things about it, and leaving the Hints to be examin'd and improv'd by the farther Experiments and Obſervations of ſuch as are inquiſitive. And if natural Philoſophy in all its Parts, by purſuing this Method, ſhall at length be perfected, the Bounds of Moral Philoſophy will be alſo enlarged.

Let us now heed Simpson's recommendation of thirty years past. The study of evolutionary tempos lies in the exclusive domain of paleobiology. It is, we believe, our most promising arena for the derivation of independent macroevolutionary theories. Conceptual tools are now available for a fruitful study of evolutionary tempos and modes.

We should therefore like to suggest that these periods are due to a 'fission' of thorium which is like that of uranium and results partly in the same products. Of course, it would be especially interesting if one could obtain one of these products from a light element, for example, by means of neutron capture.

For the moment, the general scheme we have proposed for the reproduction of deoxyribonucleic acid must be regarded as speculative. Even if it is correct, it is clear from what we have said that much remains to be discovered before the picture of genetic duplication can be described in detail.

I must confess that I have in the course of this research made myself more and more familiar with this thought, and venture to put the opinion forward, while I am quite conscious that the hypothesis advanced still requires a more solid foundation. W. C. RÖNTGEN.

Since the available data summarized in this paper are far too meager to establish such generalizations on a statistical basis, it is highly important that further studies be initiated to test the validity of these and other trophic-dynamic principles.

The results obtained in the present study suggest that the erythrocytes of other hereditary hemolytic anemias be examined for the presence of abnormal hemoglobins. This we propose to do.

New data to be expected in the near future may modify the significance of the present investigation or, if confirmatory, will lead to a solution having many times the weight. For this reason it is thought premature to discuss in detail the obvious consequences of the present results.

This suggests that the forest in the vicinity of Rogers Lake during early postglacial time was different from any known today. Admittedly, much more intensive sampling of modern and presettlement sediments in the Midwest is necessary to prove that this view is correct.

Toutefois, les expériences présentes, sans être contraires à cette hypothèse, n'autorisent pas à la formuler. Les expériences que je poursuis en ce moment pourront, je l'espère, apporter quelques éclaircissements sur ce nouvel ordre de phénomènes.

The further fact, of widely omnivorous diet, leads one to conclude that it is *not* any peculiarity of food-source, or way of getting at it, that alone limits the Thrasher associationally. We must look farther.

It would be of interest to examine the behaviour of the emanation for greater and more sudden expansions, after the manner employed by C. T. R. Wilson in his experiments on the action of ions as centres of condensation.

I ſhall ſhortly further try, whether the ſuffering the Blood to circulate through a veſſel, ſo as it may be openly expoſed to the freſh Air, will not ſuffice for the life of an Animal; and make ſome other Experiments, which, I hope, will throughly diſcover the *Genuine uſe of Reſpiration*; and afterwards conſider of what benefit this may be to Mandkind

In the future I see open fields for far more important researches. Much light will be thrown on the origin of man and his history.

We can only see a short distance ahead, but we can see plenty there that needs to be done.

It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material.

Sufficient and decisive as these arguments appear, it cannot be superfluous to seek for further confirmation

The theory of the evolution of dominance, like other mutations, is itself liable to modification. It must, I suppose, be subjected to an evolutionary process, and if it is found to be deleterious it also may end in obliteration.

Our researches upon the new radio-active bodies have given rise to a scientific movement, and have been the starting-point of numerous researches in connection with new radio-active substances, and with the investigation of the radiation of the known radio-active bodies.

There appears to be a large field for an extension of the analysis of stellar spectra into regions of the spectrum that are comparatively unexplored, and the writer hopes in the immediate future to undertake work in this direction.

The foregoing account is far from being an exhaustive one of all that has already been discovered by means of the periodic law telescope in the boundless realms of chemical evolution. Still less is it an exhaustive account of all that may yet be seen, but I trust that the little which I have said will account for the philosophical interest attached in chemistry to this law. Although but a recent scientific generalisation, it has already stood the test of laboratory verification and appears as an instrument of thought which has not yet been compelled to undergo modification; but it needs not only new applications, but also improvements, further development, and plenty of fresh energy. All this will surely come, seeing that such an assembly of men of science as the Chemical Society of Great Britain has expressed the desire to have the history of the periodic law described in a lecture dedicated to the glorious name of Faraday.

Studies designed to answer such questions should be done on a number of animal and plant populations. Only then will we have adequate information on the intensity and pattern of phenotypic natural selection.

The examples we have analyzed leave much to be desired.

Future research on the Krakatau fauna would indeed be of great interest, in view of the very dynamic equilibrium suggested by the model we have presented.

In conclusion, the long-term unpredictability of evolutionary change that arises from unpredictable ecological change, together with the need to strengthen generalizations about the frequency and importance of selection and hybridization, are reasons for encouraging additional, continuous, long-term studies of evolution in nature.

Recent reports on the prominent use of internal ribosomal entry sites in the human genome to regulate translation of specific classes of proteins suggests that this is an area that needs further research to identify the full extent of this process in the human genome (*151*).