accept neither of the suggestions which have been offered. Useful individual modifications are not directly due to the external forces, and are not due to the inherent constitution of the organism.

The only remaining hypothesis is that which I have already mentioned—the view that whenever organisms react adaptively under external forces they do so because of special powers conferred on them by natural selection. This hypothesis will, it seems to me, meet and satisfactorily explain all the facts of the case, whether employed as a preparation or as a substitute for hereditary variations accumulated by natural selection.

ASTROPHYSICAL NOTES.

IN the August number of the *Astrophysical Journal* Sir William and Lady Huggins publish a paper, read before the Royal Society in June, which throws light upon the perplexing behavior of the H and K lines of calcium in solar and stellar phenomena. It was early noted by Young that these lines were especially conspicuous in the spectrum of the solar chromosphere and prominences, while other calcium lines, strong in the ordinary solar spectrum, were seldom seen as bright lines. Recent researches with the aid of photography, chiefly by Hale, have still more emphasized the significant part played by these two radiations in chromosphere, prominences and faculæ. They rival those of hydrogen and helium in their prevalence and in the high elevations in the solar atmosphere in which they occur. It has therefore been the thought of many that possibly they are not due to calcium after all, but to some lighter gaseous element, existing as an undetected impurity in calcium, a view which after the discovery of argon in nitrogen would appear as not wholly unreasonable. Others have agreed with the opinion of Lockyer that at the excessive solar temperature the spectrum of calcium would become simplified so as to consist of but few lines, chiefly H and K, perhaps due to 'dissociation.'

The Huggins experiments now indicate, however, that the density is the determining factor, and they have succeeded in photographing in the laboratory a spectrum of calcium consisting solely of the H and K lines, with perhaps an analogous pair in the far ultra-violet region. This important result had hitherto not been accomplished by other investigators (although in retrospect, perhaps, it will appear that such plates have accidentally been secured), chiefly because the effort has been to use a spark of as high intensity as possible. The procedure now adopted consisted in taking the spectrum of a spark of feeble intensity passing between platinum electrodes which had been moistened with a solution of calcic chloride. Several *Ca* lines were present, but relatively to H and K the other lines were less intense than when electrodes of metallic calcium had been employed. On reducing the amount of calcium vapor present in the spark by successive washings of the electrodes in pure water the other lines retired, finally leaving only H and K.

These new results are confirmatory of the present view as to the extreme rareness of the vapors in the upper chromosphere, and may prove of much value in giving a criterion of the density of stellar atmospheres in the spectra of which the calcium lines appear in some of their different phases.

IN connection with the approaching dedication of the Yerkes Observatory, which will occur on October 21st and 22d, a series of conferences will be held (from October 18th to 21st) which promise to be of much interest to astrophysicists. An extensive

program of papers and informal talks by numerous astronomers and physicists has been arranged, and experimental demonstrations are to be given of certain important recent discoveries, such as the effect of pressure upon wave-length, the application of interference methods to astronomical measurements, the effect of a magnetic field on radiation, etc.

Many celestial objects and the solar phenomena are also to be shown with the forty-inch Yerkes refractor.

E. B. F.

NOTES ON INORGANIC CHEMISTRY.

From an article in the *Eisenzeitung* on the output of platinum in Russia, we take the following notes: The Russian production of platinum is forty times greater than that of all other lands together. In Russia it is found exclusively in the southern Oural region. It is shipped in its crude state to Germany and there refined. (This statement is surprising, as it has been commonly supposed that most, at least, of the Russian platinum is worked up by Johnson, Matthey & Co., of London.) The output in 1895 was 4,413 kilos as against 2,946 kilos in 1880. The cost of crude platinum in Russia is at present about $216 per kilo. The amount of iridium found with the platinum is very small, being in 1895 only 4.1 kilos, in 1894 only slightly more than this.

In the *American Journal of Science*, E. T. Allen describes several specimens of native iron from the coal measures of Missouri. They consisted of small grains, massed together in one instance in a calcareous sandstone, and in the others in a shale. Both sandstone and shale contained iron, and in two instances the grains were in close proximity to coal seams. The metallic iron in each case was quite pure and contained no nickel, and is considered to be undoubtedly of terrestrial origin.

In the *Journal* of the Russian Physico-Chemical Society, G. P. Czernik gives an account of the investigation of the gases contained in two minerals from the Caucasus, a titaniferous cerite and a coal from Tkwibulsk containing in its ash 10 per cent. of the oxides of cerium, lanthanum and didymium. The former contains 1.1 per cent. of gases, chiefly argon, with a little oxygen and hydrogen. By heating to a red heat only one-fourth of the argon was liberated, by the action of 25 per cent. sulphuric acid at 60° rathar more than one-half. Much more was given off by fusion with potassium bisulphate. The author from this concludes that the argon is in chemical combination. The second mineral contains helium, which is liberated by fusion with potassium bisulphate, even after the ash has been heated to a white heat. Here, too, the inference is that the helium is in chemical combination.

The *Bulletin* of the Pharmaceutical Society of Bordeaux, for July, contains an article by Dion on the formation of the fossil phosphate deposits of the Province of Oran. He concludes that they have an aqueous origin, being formed from above downwards by the action of infiltrating rain-water, and that animal remains were the only source of phosphorus in the deposits.

J. L. H.

SCIENTIFIC NOTES AND NEWS.

THE SPELLING OF GEOGRAPHIC NAMES.

At the regular monthly meeting of the U. S. Board on Geographic Names, held a few days ago, decisions were made as to the spelling of 149 geographic names. This Board, it will be remembered, is composed of ten members, representing those bureaus and departments of the government which are more or less concerned with geographic publications. It was created by executive order September 4, 1890, to the end that uniform usage in regard to geographic nomenclature and orthography shall obtain