We shall now see in what way such a recombination can occur. Plotting the potential energy E of the system atom-atom and then that of the system $\overset{+}{\text{ion}}$-$\overset{-}{\text{ion}}$ as a function of the distance r between two nuclei, we obtain two curves, which in the case of all heteropolar diatomic salt molecules *give an intersection* at a smaller or greater distance r_c. Such curves are represented in Fig. 1 (here J is the $\overset{+}{\text{ion}}$-$\overset{-}{\text{ion}}$ curve, A the atom-atom curve). At the intersection (r_c) the energies of the system (Me) (X) and of the system $(\overset{+}{Me})$ $(\overset{-}{X})$ are *equal*. At this point the valency electron of the metal can be 'adiabatically' transferred to the halogen atom, *i.e.* a transformation $(Me)\,(X) \rightarrow (\overset{+}{Me})\,(\overset{-}{X})$ can occur. This mechanism of the building up of NaCl was proposed by the author

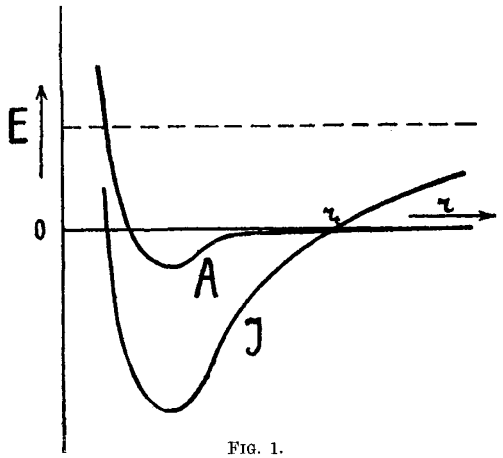

FIG. 1.

in the discussion on chemical kinetics in the first Physico-Chemical Conference in Leningrad in February 1927 (published in *Communications on the Scientific and Technical Works in the Republic*, vol. 23, Leningrad, 1927). The possibility of the transition $(A)\,(B) \rightarrow (\overset{+}{A})\,(\overset{-}{B})$ is also suggested by F. London (London, *Zs. f. Phys.*, **46**, 455; 1928).

The molecule $\overset{+}{Me}\,\overset{-}{X}$ ($Me\,X$), formed in this way from the neutral atoms, can therefore exist for a comparatively long time in a high vibrational state. The energy of vibration of such a molecule can be increased by the absorption of the temperature radiation, to a quantity $Q + J - E$ (Q is the heat of reaction $Me + X = MeX$, J the ionising potential of the cation and E the electron affinity of the anion). It is quite possible that this circumstance explains the appearance in the chemiluminescence spectrum of lines the excitation energy of which considerably exceeds the reaction heat (Q).

As to the transitions $(A) \rightarrow (J)$ at the distances $r < r_c$ we can here expect *a priori* a spontaneous transition followed by emission of light. The wavelengths of this radiation should be determined by the probabilities of the corresponding transitions. The absence of visible radiation in the reactions in question evidently suggests that the probability of the transition $(A) \rightarrow (J)$ at r_c and in the neighbouring points is very considerable.

Then we can expect the radiation in the case of recombination of one normal and one excited atom, the curves (Me') (X) or (Me) (X') and $(\overset{+}{Me})$ $(\overset{-}{X})$ of which do not intersect. It is very interesting, that in the chemiluminescence spectrum of the reaction $K + I_2$, a large continuous band is observed, but it is not observed in the case of the reaction $Na + I_2$ (Ljalikoff u. Terenin, *Zs. f. Phys.*, **40**, 107; 1926). At the same time the curves (K) (I) and $(\overset{+}{K})$ $(\overset{-}{I})$ do not intersect ($J_K - E < A_I$, $A_I = 2^2p_2 - 2^2p_1$ is the excitation energy of the metastable level of the iodine atom) and the curves (Na) (I') and $(\overset{+}{Na})$ (I) do intersect.

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Science Teaching in Schools.

I SHOULD like, if I may, to make a few observations, as briefly as possible, on the recent correspondence in NATURE on this subject.

If any discussion is to materialise, two things may safely be taken for granted, namely, that there is likely to be much diversity of opinion, and that the bulk of that opinion will be in favour of modification rather than revolution. 'The inevitability of gradualness' applies here; and it may reasonably be urged (*a*) that the present system is not altogether devoid of good qualities, and (*b*) that the scientific attitude, which is far more important than mere book knowledge, may be acquired in any branch of science, whether physics, chemistry, or biology. I think we may assume that at present the abolition of the 'subject' system is impracticable, even if it were desirable. There are some who fear, not without justification, that too extended a course of elementary science tends to degenerate into what the Rev. Dr. Folliott stigmatised some years ago as "everything for everybody, science for all, schools for all, rhetoric for all, law for all, physic for all, words for all, and sense for none."

Again, it would be unfortunate if by any means, democratic or despotic, too exact a syllabus were to be imposed upon schools. We all have our own ideas, and teach best those things in which we are most interested. My plea is for greater liberty in this respect, and for more time in which to deal with essential mental and manipulative processes; and these can only be gained if the university examiners agree to modify their demands. They could easily do this, if they chose, and could thereby succeed in distinguishing between boys of real ability and those who had merely crammed far more efficiently than at present.

I have reason to believe that the suggestion was made last year that some of the university examiners should meet the Science Masters' Association in London, and that the examiners themselves were willing, and even anxious, to do so. It would be interesting to know on what grounds so desirable a step was frustrated.

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FROM the recent correspondence which has appeared in NATURE on the teaching of science in schools, the most striking impression I have obtained is that on a problem which one would expect to be perfectly straightforward, opinions differ enormously. In other words, it is evident that those people who are now engaged in teaching science do not themselves know, as a body, what their aims and objects are, and what are the best methods necessary to attain them. Controversy is always stimulating, but when it arises from such a wide range of opinion it tends to hamper progressive movement, and has a bad effect on those people who in perfect good faith listen to each expert in turn.

As one who has taught many branches of elementary science for some years, it seems to me that the relations