Oseen and Born, in connexion with his own previous work, which explained optical activity in terms of the asymmetry of the molecule; he does not, like the above authors, assume resonance, but uses the single idea of the asymmetry of the field of force, taking into account the experimental data. The theory indicates, in apparent agreement with observation, that the rotary power should increase when the number of atoms is large, when the masses and atomic volumes are large, and when the atoms are arranged very unsymmetrically. It also shows that the rotary dispersion is related to the refractive dispersion; and the specific rotary power should, in general, diminish with increase of temperature, and should increase with the pressure. There are, however, certain discrepancies in passing from the liquid state to that of vapour. Modifications of the molecular structure due to lack of rigidity of the molecule, which would not affect the refractive index, may produce marked changes in the optical activity, and the rotary power must be a very delicate index of molecular phenomena. This accounts for the difficulty of finding simple laws connecting the phenomenon as observed in different substances. The theory indicates that the Airy-Gouy formula can no longer hold rigorously for high refractivity; apparently this commences to be true in the case of carvone.

Engineering and Shipbuilding.

IT is not easy to state reasons for the present depression in the engineering and shipbuilding trades without touching upon political matters, and both Mr. J. Howden Hume and Mr. Tom Westgarth found this difficulty in their presidential addresses to the Institution of Engineers and Shipbuilders in Scotland and the North-East Coast Institution of Engineers and Shipbuilders respectively. Still in both addresses there is much of interest and several valuable suggestions.

Mr. Hume attributes the depression to (*a*) the loss of our export trade; (*b*) the Washington Treaty, which has seriously affected not only workmen engaged in engineering and shipbuilding, but also those on the technical and scientific staffs, and those connected with allied trades, besides the artisans in districts where warship building was carried out; (*c*) the world's market on the merchant shipping side has partially collapsed, and there was over-production of merchant ships during and immediately after the War.

Mr. Hume suggests (i.) that the whole question should be taken out of the political field and placed in the hands of a representative body, chosen, say, by half-a-dozen of the leading judges, and comprising equal numbers of manufacturers, workmen, merchants, and professional men. Such a body would arrive at the truth, and a plan could be devised and acted upon by the Government in power. (ii.) A complete and friendly understanding between employer and employed. The Shipping Federation and the National Sailors' and Firemen's Union have worked together for thirteen years, and in that time there has been no strike in the shipping trade. Other bodies might follow this lead.

The subject of Mr. Westgarth's address was waste. Of all sources of waste in industry, the greatest is that caused by strikes and lockouts, by demarcation difficulties between trades, and by people of all classes not doing a fair day's work for a fair day's pay. Many disputes are the result of neglect and delay in dealing with difficulties as they arise, and something of the old-fashioned discussion between master and workmen immediately a difficulty appears should be revived. Such discussion should be informal and not binding on the official representatives of either side. By this method a great many disputes would probably never be taken outside the works. In 1921, 85,872,000 working days were lost through disputes, and 10,642,000 in 1923, according to the Ministry of Labour Gazette. Nearly all this waste is preventable, and could be prevented by friendly conference. Sir Robert Hadfield's suggestion that an endeavour should be made to arrange an industrial truce is worthy of the most serious consideration.

Mr. Westgarth referred to a fruitful cause of unrest: wages in the so-called protected trades do not compare reasonably with those in the highly skilled and competitive trades. If competition in the open markets of the world makes it impossible to pay skilled workmen a certain wage, it is in the highest degree wasteful to pay considerably higher wages to unskilled men just because a stoppage of their work would be an inconvenience to the public. This really amounts to a kind of blackmail, and the public should be assisted in resisting such claims by their governing representatives.

In reference to technical waste, Mr. Westgarth says that the engineering industries can only be successfully conducted nowadays by helping to make possible the discovery of new methods of manufacture and fostering the advancement of new ideas in engineering science—as distinct from teaching engineering science—and then by giving commercial expression to the best of such methods and ideas. Has such a policy been characteristic of British engineering? The future of British engineering will be good or bad according as the spirit of scientific progress develops or flags.

Electrical Precipitation.[1]

THE two kinds of electrical precipitation dealt with were the natural and the artificial. Artificial precipitation began with the well-known experiment which Sir Oliver Lodge showed to the British Association at Montreal in 1884 on the electrical deposition of smoke or steam; an observation which has now been applied on a large scale in Great Britain, by his sons and by Dr. Cottrell in the United States, to the recovery of metallic fume, and to the freeing of blast-furnace gas from solid material before combustion. The theory of the action is like that of the coherer, and was considerably elucidated by the late Lord Rayleigh's experiments on the cohesion of liquid jets and drops, under slight electrical stimulus.

The natural kind of electrical precipitation is what occurs in the atmosphere when clouds turn into rain; and also when, as shown by Dr. G. C. Simpson, large water-drops break up in a column of ascending air, giving rise to separation of electricities and the phenomenon of thunderstorms. This mode of generating electricity is somewhat surprising. A theory of it is suggested by the coherer and water-drop experiments; since the breaking-up of a drop may be regarded as the converse action to the cohesion of two drops. Electrical influence stimulates cohesion: it is possible that absorption may give rise to electrical separation. Not that the two fragments become oppositely electrified, but because the uniting electronic layer is blown away by the air, thus carrying away a negative charge and leaving the residual water positive. Calculation applied to this phenomenon seems to give results of the right order of magnitude, making use of Dr. Simpson's measurements of the charge which can thus be imparted to the fragments

[1] Abstract of an address by Sir Oliver Lodge, F.R.S., delivered on Wednesday, October 29, to the Institute of Physics.