

A Notable Exhibition of Physical Apparatus.

THE Physical Society of London and the Optical Society held their twelfth exhibition of electrical, optical, and other apparatus at the Imperial College of Science on January 4 and 5. As in past years, the exhibition rooms were crowded with apparatus and visitors; the latter were so numerous that the exhibition became a continuous one instead of closing between 6 and 7 p.m. each day. The display of scientific apparatus was probably the finest ever seen in this country, and the quality and finish of the instruments left little to be desired. There were many instruments of novel design, but attention can be directed to a few only.

A quite novel exhibit was an optical sonometer by the firm of Hilger, Ltd. This is designed to record the pressure variations caused by sound-waves, and should prove invaluable to workers in acoustics. The most novel feature is the diaphragm; which is a film having a thickness of a fraction of a wave-length of light, and is silvered or gilded on one side by a cathode process. The sound-wave under examination is received by a horn, and causes the diaphragm, and ultimately a beam of light, to vibrate. An intense point image is produced, and a photographic record can be obtained on a rotating film. The vowel sounds and all kinds of acoustic disturbances may thus be analysed. In another arrangement, which is excellently adapted for demonstration purposes, a rotating band with white lines on a dark ground is illuminated by a line image from the diaphragm. By adjustment of the speed of rotation stationary wave effects are obtained.

The episcopo, shown by Newton and Co., is a marked improvement on forms previously seen, and should come into more general use for the projection on screens of opaque objects. The present instrument is of beautiful design, and with its two 2000-candle-power lamps very bright pictures of opaque objects may be projected on a screen 5 metres or more away. In large teaching institutions this instrument could be put to many uses.

The Marconi Co. exhibited its new automatic alarm which responds to the wireless call of a ship in distress. In the present form of instrument the distress call must consist of three dashes, each of four seconds' duration, the dashes being separated by one-second intervals. By means of an amplifying circuit, plungers working in dash-pots are caused to respond to the four-second impulses, and after a series of three such impulses a warning signal occurs. If the impulses last for more or less than four seconds, subject to a tolerance of about half a second, the circuit necessary to operate the alarm is not completed. The demonstrations given were accompanied by artificial atmospherics and continuous wireless reception, and were remarkably successful.

Creed and Co. again showed their system of high-speed automatic printing of wireless messages, but at an increased speed of reception. Signals from Chelmsford were regularly received, the Morse code perforations in a paper strip being transposed into Roman characters by an automatic printer. The speed ranges from 50 to 200 words per minute.

While the writer was present a message was received from the Marconi Co. conveying its wishes for the success of the exhibition. The receiving aerial appeared to be a very insignificant affair, and many visitors marvelled at the present efficiency of triode-valve amplifiers.

A novel weather foreteller, the design of which is due to Mr. Kitchen, was shown by Negretti and Zambra. The instrument is based on meteorological data extending over many years. The forecast for twelve hours appears in a small window in the instrument after the barometer and wind-scales have been set to correspond to the conditions existing at the time. It would be of interest to have a record over six months of "predictions" and "happenings."

Tucker's hot-wire resonator microphone was shown by H. W. Sullivan. The microphone consists of a heated wire in the neck of a resonator and is insensitive to all but the particular sound frequency which it is desired to receive. The hot wire is cooled by the oscillating air-currents at the resonant frequency, and the change in the resistance of the wire is caused to operate an amplifier.

The Cambridge and Paul Instrument Co. exhibited a novel temperature regulator, in which the current from a thermo-couple in a furnace passes through a millivoltmeter, at the end of the pointer of which is a light thermo-couple in series with a moving coil relay. When the furnace is at the temperature which it is desired to maintain, the light thermo-couple is brought, by the movement of the pointer, into close juxtaposition to a small heated body. A current is thus generated which operates the relay and indirectly controls the current in the furnace. The instrument exhibited controlled a small electric furnace at about 700° C. within about 5° C.

The Edison Swan Co. showed a 10,000-candle-power pointolite lamp of ingenious construction; many visitors remarked on the skill required to seal leads into glass for the passage of a current of 40 amperes. The firm of Ilford, Ltd., showed a new and improved colourless filter which completely cuts off ultra-violet rays. It is claimed to be much superior to the usual æsculin filter, and is known as "Q" (acetaminquinoline). The Davison microtelescope, while not new, attracted considerable attention, and users of the microscope admired a new 25-watt mercury vapour lamp made by Chas. Baker. Shotter's integrator for water-flow meters was shown by H. Tinsley; it represents a new application of the Wheatstone bridge. Among precise measuring instruments the Campbell fundamental standard of mutual inductance (shown by R. W. Paul) must be mentioned, and also the "Talymin," by Taylor, Taylor and Hobson, which determines within small limits of error the outside diameters of small manufactured parts.

An experimental lecture on "The Johnsen-Rahbek Electrostatic Telephone and its Predecessors" was given on both days by Mr. A. A. Campbell Swinton. Another lecture on "Radium: Its Application in Peace and War" was delivered by Mr. F. Harrison Glew, and a third lecture on "The Employment of Coarse Wire Gratings in Astronomy" was given by Sir Frank W. Dyson. These lectures were attended by large audiences, and were highly appreciated.

Science in Secondary Schools

THE twenty-second annual general meeting of the Science Masters' Association, which was held last week at the Imperial College of Science, was presided over by the Master of Balliol. His address on the subject of the relationship of history and

science will long be remembered by those who were fortunate enough to hear it for the genial humour and literary grace with which he defined the position and importance of these complementary branches of learning.