

Congleton and Matlock to the south, embracing portions of five counties, and sources of several head-streams of the Mersey, Dee, Trent, and Yorkshire Ouse.

There are several elevations of a little more than 2000 feet, and a large proportion of the district consists of unenclosed moorland and grassland. The maps are coloured to show the plant formations of acidic peat, siliceous soil, calcareous soil, sandy soil, and of cultivated land. The plant formations are subdivided into associations. For example, the formation of acidic peat exhibits associations in which *Vaccinium Myrtillus*, *Eriophorum vaginatum*, *Calluna vulgaris* respectively dominate, and others in which two of these units are more or less equally dominant.

Following an introduction, dealing, among other things, with rainfall, temperature, and winds, are chapters on woodland, scrub, grassland, moorland, rocks and scree, marsh, and aquatic and cultivated land associations. Summaries of the plant communities (these include formations and associations) of the Peak district and of Britain conclude a most interesting book, the illustrations and maps of which are excellent. W. B. H.

Outlines of Stationery Testing. A Practical Manual. By H. A. Bromley. Pp. 74. (London: C. Griffin and Co., Ltd., 1913.) Price 2s. 6d. net.

THIS little manual deals chiefly with the technical examination of paper, though other articles of stationery are included in its scope. It avoids theoretical considerations, and gives in simple language concise instructions for the practical testing of paper, physically, microscopically, and chemically. Under the first heading come questions of colour, nature of the paper, surface or "finish," texture, opacity, ink-bearing properties, and strength. Short notes are supplied explaining these terms as applied to paper, and the methods of testing the properties indicated by them.

Few words are wasted in the chapter devoted to explaining the microscopic examination of paper. The author has managed to condense the description of the examination into five small pages, whilst another five are allotted to plates showing the microscopic characters of the principal fibres.

Under the head of chemical examination, directions are given for determining the nature and amount of the mineral matter used as "loading," and of the organic substances, such as gelatine, rosin, casein, and starch, employed in the "sizing" of paper. Methods are also propounded for discriminating the colouring ingredients and detecting chemically certain fibres and impurities. In all cases, the author claims, the chemical processes described are those which require the simplest possible apparatus. The characteristics of special kinds of paper are indicated briefly, and the book concludes with short sections on the testing of ink, gum, sealing-wax, and other miscellaneous articles included in the term "stationery." Within its limits—those of a collection of notes for use in practically examining stationery—the book will be found useful.

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LETTERS TO THE EDITOR.

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Pianoforte Touch.

I CAN fully endorse Dr. Heaviside's opinions as to the possibilities of the piano-player, and could only wish that there were some reasonable prospect of this instrument being used to save a great portion of the uninteresting drudgery of the usual school music-lesson. At the present time a considerable amount of school time is wasted in attempting to learn an instrument which is so difficult to play that few succeed in obtaining any satisfactory results. This system does not succeed in producing musicians any better than the ordinary school algebra lesson succeeds in producing mathematicians.

On the other hand, my recent experiments in connection with this "patent" control have led me carefully to test the existing commercial piano-players, and I can fully endorse Mr. Wheatley's complaints as to their lack of responsiveness and their persistent assertion of their mechanical individuality in opposition to the most strenuous efforts of the performer controlling them. The methods of varying expression by means of punch-holes, or by damping down all the notes on one side or other of a hard and fast dividing line, produce a very pleasing impression at first, but one soon tires of their very limited capabilities.

In these circumstances I would strongly recommend Mr. Wheatley and any other readers of NATURE who are interested in the subject to experiment with the methods of control claimed in my patent specifications. Even a rough and ready device rigged up with sticks, strings, and kitchen weights produces such a great improvement in the range of effects and flexibility of the instrument that after experimenting with such an arrangement I found it impossible to obtain any satisfaction without it. I think it may be safely said that the mechanical self-assertiveness of the instrument can be reduced to a small quantity of the second order, and can be further reduced by a method of successive approximation. So soon as dynamical considerations are introduced the possibility of accenting notes in chords (*i.e.* proper chords, not the miserable arpeggios which are so often substituted for them in recently cut music rolls) becomes evident, and the production of variations of tone quality by differences of touch is probably much easier when effected this way than when the keys are played by hand. All this appears less difficult to learn than the control of the speed regulator, which must always remain a difficulty.

The absence of these capabilities constitutes the great defect of the commercial player. But the ordinary "practical man" cannot understand anything based on the principles of dynamics and physics, consequently he treats the pressure as if it were constant instead of a very variable function of the time, and the result is an instrument which is mechanical and little else, and can only be played with an unnecessary expenditure of energy.

I have heard a professional pianist perform a very delicate *pianissimo* passage in which the accented notes rang out clearly and brilliantly above the background without being played any louder. It was simply a difference of tone quality produced by a corresponding difference of touch. My dynamically-controlled piano-player is quite capable of giving a