

pecially suitable for table-tops, counter-tops, mantel-pieces, hearthstones, and tessellated pavements.

His third invention consists of what he terms "Alphabetical Bricks," as, for instance, one brick made like the letter H forms a hollow wall, the two sides being bound together by the bar of brick in the centre, and forming one brick. The bottom and top is closed up by the letters T or L or I, so **IT** lying flat and joined together, and over each other make a complete hollow wall, which may be used for purposes of ventilation and for carrying off smoke, indeed, doing away altogether with the necessity for chimneys. We may mention that these letters can be so combined as to form either the English or Flemish bonds.—*Ottawa Ez.*

THE FASHION PLATES.

Our two pages of fashion plates give the latest styles in ladies' House and Promenade costumes for early spring.

No. 1. Costume for a young girl from 10 to 12. The underskirt is of blue cashmere, with a gathered flounce pleated at the top and trimmed with black velvet ribbon. Grey poplin overskirt and Pompadour waist, the latter trimmed with pleated ruffles and rolls of the same material. Batiste blouse with long sleeves, and sash of blue grosgrain ribbon.

No. 2. Grey *Toile-de-Laine* House Dress.—This dress consists of a double skirt and basque-waist. The underskirt is trimmed with a broad gathered flounce, headed with two bias folds of a darker shade. The overskirt and basque-waist are similarly trimmed and button up the front. Cravat and head bows of maroon *Crispe-de-Chine*.

No. 3. Costume for a Young Girl from 10 to 12.—Costume of reddish-brown or maroon woollen-poplin. The underskirt is kilt-pleated. Overskirt and Pompadour waist are trimmed with pleated ruffles and rolls of the same material as the dress. Batiste blouse with long sleeves.

No. 4. Brown Cloth Suit. The whole dress—consisting of skirt, panier, and basque-waist—is of tan-coloured cloth, trimmed with bias stripes of silk of a darker shade and silk fringe to match.

No. 5. Promenade Costume of Brown Silk, trimmed with rolls of the same and fringe to match. Round hat of black tulle.

No. 6. Bleached *Toile-de-Soie* Morning Dress.—This dress consists of skirt and tightly fitting basque of bleached *toile-de-soie*—a twilled material, woven of wool and silk—trimmed with pleated ruffles of the same material, embroidered batiste insertion and lace edging.

No. 7.—Silk Dress in Two Shades of Brown.—The dress consists of a triple skirt and high basque-waist of brown silk of two shades. The under and overskirts are of a light shade, and are trimmed with dark brown cord embroidery. The second skirt and basque are of a deeper shade and plain. The overskirt is looped up at either side with three embroidered loops of dark brown silk which cross over the back of the basque.

No. 8.—Pearl Grey Poplin Dress trimmed with pinked silk ruffles of the same colour. The underskirt has in addition a single ruche of the material of the dress. Sash of a darker shade of grey.

No. 9. Silk and Cashmere Costume.—The underskirt and waist are made of some fashionable coloured silk; the sleeveless jacket and overskirt of cashmere to match. The overskirt buttons in front and is looped-up at either side with a sash.

Nos. 10 and 11.—Black Cashmere Talma.—The Talma is lined with lustrine, and the capuchon with grosgrain. Trim the Talma with bias strips of cashmere, scalloped and embroidered with silk cord. The scalloped edge should be trimmed with black lace and black silk fringe. Furnish the capuchon with cord-work and tassels.

Nos. 12 and 13.—The basque is made of light grey *tricot*, with a binding $\frac{1}{2}$ of an inch wide of satin of the same shade. The collar, together with the strips at the lower edge of the basque and round the sleeve, is of a darker shade. Light grey satin buttons.

Nos. 14 and 15.—Black Cashmere Basque, scalloped and edged with cord; with silk lining and a silk fringe trimming $\frac{1}{4}$ in. deep. A triangular piece, similarly scalloped and trimmed is sewn on the back as shown in the engraving.

Nos. 16 and 17. Grey *Tricot* Basque, trimmed with black velvet $\frac{1}{4}$ in. broad and black velvet bows, and gathered at the back with a bow.

No. 18. Black Grosgrain Basque, edged with a ruching of the same $\frac{3}{4}$ in. deep. Trimmed with black cord work and a *postmenterie* border $\frac{1}{4}$ in. deep.

ARSENICAL POISONING.

The third report of the Massachusetts State Board of Health contains a valuable article on the evil effects of the use of arsenic in certain shades of green. The subject is not new; more than one hundred years ago the use of arsenic as a pigment in certain manufactures was forbidden by law in France. But the beauty and healthfulness to the eye of the colour, and the thoughtlessness or cupidity of makers of wall paper, artificial flowers, toys, lamp shades, confectionery and other articles, render it necessary to warn the public again and again of the injury—sometimes a fatal one—inflicted by its use.

It appears that arsenic, aside from its use in medicine and in destroying vermin, is employed in the arts, mainly as a large ingredient of green colouring pigments. Into one of these it enters as the arsenic of copper, known popularly as Scheele's green, and into another as the aceto-arsenite of copper, which is called Schweinfurt green. The generic name of emerald or mineral green is applied indifferently to either. Of these two colours, the first contains fifty-five per cent, more than one half, of white arsenic; the other in every one hundred grains, contains fifty-eight grains of arsenic. Both pigments furnish the prettiest and most durable shades of green, each costs comparatively little, and the process of manufacture does not require great skill. Hence, in spite of their deleterious effects, both are used. At one time, in Paris, when it was proposed to make the use of arsenic illegal in the manufacture of wall paper and artificial flowers certain of the makers said such a law would force them to close their shops; and in 1860 a paper maker in England said that in his shops alone two tons of arsenic were used weekly.

The most frequent instances of poisoning by these colours have followed the use of green paper hangings. Makers of the paper, dealers in it, paper hangers and even people who live in the rooms papered with it have often suffered under every symptom of poisoning by arsenic, and in some cases

have received lasting or fatal injury. In 1862, in London, four children died in succession, and a *post mortem* chemical examination in the case of the last one showed traces of arsenic. The walls of the room in which they lived were covered with green paper, in which chemical tests showed the presence of arsenic—three grains in every square foot. In 1859, a middle aged woman in Boston was attacked with the well known symptoms of arsenic poisoning; and although her life was saved by removing the paper, yet her health was permanently injured. Such cases might be multiplied almost indefinitely from the reports of physicians.

Some years ago this subject excited considerable discussion, and arsenical paper hangings became unfashionable. The fashion appears to have changed again, however. Dr. Flank W. Draper, author of the article on this subject in the report, says that, in every store he visited while making his investigations, he found paper for sale which, on being tested, showed signs of the presence of arsenic. Under these circumstances, it would be well if every one who wishes to buy any green wall paper would subject it to the following simple chemical tests:

Take a fragment of the paper and put it into a solution of ammonia. If arsenic be present, the liquid will assume a bluish colour. In case a further test is required, pour a little of the ammoniacal solution on crystals of nitrate of silver; and arsenic, if present, will show itself by leaving a yellow deposit on the crystals. As arsenic is used in colouring all qualities of paper, from the cheapest to the costliest, a knowledge of this test will be of service to every one, whether dealer or customer.

It is of some interest to know how the poisoning by wall paper is effected. Formerly it was held that the poison was set free by some kind of decomposition, and vitiated the air as a gas. The modern theory is, however, that "the poison escapes from the paper into the atmosphere in the form of dust, mechanically disengaged," as by dusting or wiping the walls, or jarring them in any way. The dust of a room whose walls were covered with paper containing arsenic, on being submitted to a delicate chemical test, is said to have exhibited unmistakable traces of the poison.

But it is not alone in colouring wall paper that the poisonous pigments are used. Confectionery, pastry, ornaments and toys are coloured with them, articles that soon find their way to children's mouths. Toy boxes of water colours furnish an illustration. One of the green blocks of paint, weighing 38.26 grains, on analysis was found to contain 8.83 grains of arsenic. The shelves in closets and pantries are sometimes covered with arsenic paint, from which the poison is easily absorbed by any warm or moist substance. The brilliant green paper so common for covering paste-board boxes, for tickets, for *bonbon* wrappers, for lamp shades, is coloured with arsenic. The green of artificial grass and leaves is generally produced by arsenic. In one case, in a single twig of twelve leaves, ten grains of pure arsenic were found. Arsenic is used to colour cloth for women's dresses. Dr. Draper procured a sample of the stuff called *tarlatan*, resembling muslin, at one of the retail stores in Boston, which was found to hold feebly 8.21 grains of white arsenic to every square foot. To handle or to wear such goods is dangerous to life.—*Scientific American*.

SURFACE ELECTRICITY.

It is well known that Faraday made numerous experiments upon this subject, and has varied, under different forms, that which Coulomb has realised with the hollow sphere and its two covers. It is still under this form, the least commodious, that this experiment is repeated in the lecture-room.

If the loss is considerable on the day when this experiment is performed, it ceases to be sufficiently conclusive; for it requires, first, to electrify the sphere alone; second, to recover it rapidly with its two covers; third, to take them off; fourth, to prove that these covers are electrified; and, fifth, that the sphere is not. The second operation cannot be executed with great rapidity on account of the form of the covers.

Amongst other experiments Faraday has made the following: he took a cylinder made of metallic gauze placed upon an insulated horizontal metallic disc, the design being to afford proof that the exterior is alone electrified. An animal, such as a mouse, placed in the interior, showed no commotion, even when the whole apparatus was electrified so strongly that bright sparks might be obtained from it.

Faraday did more, he constructed a cubical chamber 12 ft. on each side, with laths, the walls were of wire gauze and of paper, and the whole chamber was suspended by means of silken ropes. The chamber, even the interior, could be electrified strongly on connecting it with an electric machine. Faraday enclosed himself in this chamber with electroscopes and various other apparatus, but he failed to find the least trace of electricity, whilst the walls were so strongly electrified that vivid sparks were obtained from the outside, and "brushes" escaped spontaneously.

M. Terquem has endeavoured to repeat this experiment in lectures, on a small scale, in the following manner. He took any form of birdcage, whether of wood and iron wire, or entirely of metal, and suspended it to some insulated conductor in communication with the electric machine. Inside the cage was placed a gold-leaf electroscope, and also pieces of tinsel, the feather of a quill, and pith balls. Whilst it was possible to obtain vivid sparks from the cage nothing moved in the interior. Within the cage was suspended a bundle of linen yarn, and underneath the cage a similar bundle; the interior bundle remained undisturbed, whilst the exterior was greatly excited and electrified, all the bits of yarn spreading out, and on approaching the hand the peculiar crackling due to electricity was heard.

Bands of paper being stuck along the length of the wires of the cage, the exterior bands would twist strongly, and get displaced, whilst the interior remained vertical and unmoved when the cage was electrified. To complete the experiment, a bird might be placed inside the cage, and by his singing and general demeanour prove that he was not only completely indifferent to the phenomenon of electrical charge and discharge, but that behaving so proved that the interior of the cage was perfectly free from all electrical phenomena, whilst the exterior alone was susceptible to the electrical influences.

We quite agree with M. Terquem, that this experiment is very simple, full of proof, very easy indeed to prove, and, above all, requires neither complicated nor costly apparatus, and is one that might be frequently introduced into the lecture room as a proof of one of the most interesting points in electricity.—*Engineering*.

CHESS.

Solutions to problems sent in by Correspondents will be duly acknowledged.

T. W. J. Halifax, N. S.—The rule you mention, with reference to "Queening a pawn," is recognized as correct by Chess-players generally.

Staunton's "Handbook" is probably the best for beginners. The well-known position you sent (inserted as Problem No. 45) is solved as follows:—

White.	Black.
1. R. to K. B. 5th	K. to Q. sq.
2. R. to Q. B. 5th	K. to K. sq.
3. R. to Q. B. 8th, mates.	

VARIATIONS.

White.	Black.
1. R. to Q. 5th	K. to K. B. sq.
2. R. to K. Kt. 5th	K. to K. sq.
3. R. to K. Kt. 8th, mate.	
1. R. to K. Kt. 5th	K. to B. sq.
2. R. to Kt. 3rd or 4th, &c.	K. to K. sq.
3. R. to Kt. 8th, mate.	
1. R. to Q. B. 5th	K. to B. sq.
2. R. to Kt. 5th	K. to K. sq.
3. R. to Kt. 8th, mate.	

Several other variations must be obvious from the above.

A. H. W. Sherbrooke, P. Q.: "Tyro," Montreal.—Solutions received correct.

Wm. S., Montreal.—Your solution is not correct.

We welcome an addition to Chess literature in a column appearing weekly in *The Mail*, a newspaper which made its *début* lately in Toronto, Ont.

TORONTO V. SEAFORTH.

SECOND CONSULTATION GAME BY TELEGRAPH.

The players for Seaforth were Dr. Smith, Dr. Gouniblock and Mr. H. R. Jackson; for Toronto, Messrs. H. Northcote, G. H. Larimie and J. H. Gordon.

KING'S BISHOP'S GAMBIT.

White. Toronto.	Black. Seaforth.
1. P. to K. 4th	P. to K. 4th
2. P. to K. B. 4th	P. takes P.
3. B. to Q. B. 4th	K. Kt. to B. 3rd
4. Q. Kt. to B. 3rd	B. to Q. Kt. 5th
5. P. to K. 5th	P. to Q. 4th
6. B. to Q. Kt. 5th, ch.	P. to Q. B. 3rd
7. P. takes Kt.	B. takes Kt. (a)
8. Q. takes Kt.	P. takes B.
9. P. takes P.	Q. to K. 2nd, ch.
10. Q. to K. 2nd	K. to Kt.
11. Q. takes Q. ch.	K. takes Q.
12. B. takes P. (b)	P. takes P.
13. B. to Kt. 3rd	Q. Kt. to B. 3rd
14. Kt. to B. 3rd	K. to K. 3rd (c)
15. Castles. (K. R.)	K. to Q. 2nd
16. Q. R. to Q.	R. to Kt. 5th (d)
17. K. to Q. 3rd	R. to Q. B.
18. Kt. to Q. 2nd	Kt. to R. 4th
19. P. to Q. Kt. 3rd	Q. R. to K. Kt.
20. K. R. to B. 4th	R. takes R.
21. B. takes R.	R. to Kt. 5th
22. P. to K. Kt. 3rd	Kt. to B. 3rd
23. Kt. to K. 4th	R. to Kt. 3rd
24. Kt. to Q. 5th	Kt. to K. 2nd
25. Kt. takes P. at Kt. 4th	B. to B. 4th
26. R. to Q. 2nd	P. to Q. R. 3rd
27. Kt. to B. 7th	B. to K. 5th
28. Kt. takes Q. P.	Kt. takes Kt.
29. P. to Q. B. 4th	R. to Q. B. 3rd
30. K. to B. 2nd	K. to B.
31. P. takes Kt.	R. takes P.
32. R. takes B. ch.	B. takes R.
33. P. to Q. Kt. 4th (e)	P. to K. R. 4th (f)
34. K. to K. 3rd	K. to Q. 2nd
35. K. to Q. 4th	B. to Kt. 5th
36. P. to Q. R. 3rd	P. to K. B. 3rd
37. P. to K. R. 3rd	B. to B. 4th (g)
38. P. to K. Kt. 3th (h)	P. takes P.
39. P. to K. R. 4th	K. to K. 2nd (i)
40. K. to B. 5th	B. to K. 5th
41. P. to K. R. 5th	K. to Q. 2nd
42. P. to R. 6th	B. to B. 4th
43. K. to Kt. 6th	K. to B.
44. P. to Q. 5th	B. to Q. 5th
45. P. to Q. R. 4th	B. to K. 5th
46. K. to R. 7th	B. to Q. 6th
47. P. to Kt. 5th	P. takes P.
48. P. takes P.	B. to K. 5th
49. P. to Kt. 6th	B. to B. 4th
50. P. to Q. 7th, ch.	K. takes P.
51. K. takes P.	Resigns.

(a) This does not seem so good as P. takes B.

(b) White have now the freer game.

(c) P. to Kt. 5th strikes us as better for Black here.

(d) This open file is favourable for the defence throughout.

(e) To prevent Black from winning a pawn by B. to Kt. 5th, &c. the ending now requires the greatest exactitude.

(f) B. to K. 5th followed by P. to K. B. 4th, as suggested by the *Black*, seems to be the correct play.

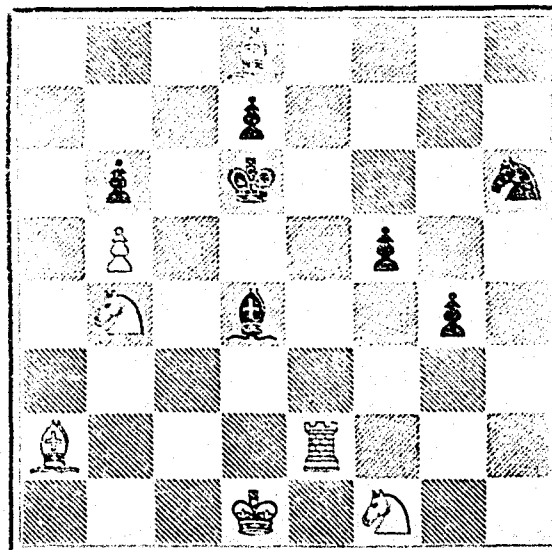
(g) The best move apparently.

(h) P. to R. 4th seems to leave an easy "draw" for Black.

(i) A fatal error: even yet P. to Q. Kt. 3rd seems to draw, if properly followed up.

PROBLEM No. 46

BLACK.



WHITE.

White to play and mate in three moves.