

SCIENCE NOTES.

THE ODOURS OF PLANTS.—It may be laid down, as a general principle, that a larger proportion of white flowers are fragrant than those of any other colour; yellow come next, then red, and lastly blue; after which, and in the same order, may be reckoned violet, green, orange, brown, and black.

FROZEN BEEF ESSENCE.—Dr. H. B. Hare (*Philadelphia Medical Journal*) writes that, in a case of scarlet fever in a child, the patient could not be induced to swallow the beef-ten which his condition required. As he took ice with avidity, the father suggested that if the beef-ten was frozen he might then be induced to take it in that form. The suggestion was carried out, and the child took the frozen beef-ten readily. This expedient may in many cases be advantageously adopted.

VEGETABLE SPORES IN THE BLOOD.—Prof. Richardson, of Philadelphia, several years ago, in the course of his experiment to determine whether bacteria (vegetable spores) pass from the stomach into the blood, swallowed 4 ounces of water which contained, according to his estimate, 27,000,000,000 of these minute organisms. In half an hour he discovered them in abundance in a drop of blood taken from the end of his finger. To swallow at a single gulp twenty times as many vegetable spores as there are human inhabitants on the earth, is but a small exploit for a modern scientist.

PHOTOGRAPHIC INVENTION.—Among the most remarkable of discoveries in photography is that claimed by one Johnson, an Englishman. The invention is a panoramic camera, which, by ingenious mechanism, sweeps the whole landscape and takes it on a plain surface embracing on one negative one-third of the circle. The exactitude of its operation is as singular as the beauty of the results. The pantoscope begins at one end of the view desired and goes round the horizon as one sweeps the telescope, the plate moving with a corresponding motion through the arc, which might be a circle if it were desirable.

CHEMICAL CHANGES.—The addition of an atom of water to starch converts it into sugar; the subtraction of an atom from alcohol converts it into ether. But perhaps the most curious change produced by the removal of an atom of water from a body has been recently discovered by Dr. Matthiessen, of London. Morphine, the well-known active principle of opium, is commonly used to allay vomiting, and very often performs the duty very effectually. But when morphine has been heated with hydrochloric acid, and an atom of water has been thereby removed, it is changed into the most active emetic known. It is not necessary to swallow it to produce the effect; a very small quantity introduced under the skin, or even, it seems, spilt upon the hand, is quite sufficient to produce vomiting, which, however, soon subsides, and leaves no nausea afterwards.

COPYING DRAWINGS BY THE AID OF THE INDUCTION COIL.—All draftsmen are acquainted with the device of puncturing holes through a drawing for the purpose of obtaining an outline and afterwards transferring the outline, by sifting fine plumbago or other powder through the small holes. The fatigue of making the holes by hand is great, and M. Cauderay, of Lausanne, proposes to employ the induction coil for this purpose. A table covered with tin foil is connected with the negative pole, on it may be placed as many sheets of paper as the spark will pass through. The positive pole, consisting of a metal bar, insulated with gutta-percha, can serve as a pencil for copying the tracings. The metal point of the pencil being moved about on the contour and outline of the engraving, electric sparks spring across every time a connection is made, and puncture fine holes through the paper.—*Scientific American*.

COPYING PRESS.—A clever application of science to commercial purposes has been made by an Italian gentleman, M. Eugenio de Zucato, of Padua. By means of the invention any number of copies of a manuscript or design, traced upon a varnished metal plate, may be produced in an ordinary copying press. The *modus operandi* is very simple. To the bed and upper plate of a press are attached wires leading from a small battery, so that when the top of the instrument is screwed down the two metal surfaces come into contact, and an electric current passes. An iron plate resting upon the bed of the press is coated with varnish, and upon this surface is written with a steel point any communication it is desired to copy. The letters having thus been formed in bare metal, a few sheets of copying paper are impregnated with an acid solution of prussiate of potash, and placed upon the scratched plate, which is then subjected to pressure in the copying press. An electric current passes wherever the metal has been left bare, (where the writing is therefore,) and the prussiate solution acting upon the iron, there is found prussiate of iron or Prussian blue characters, corresponding to those scratched upon the plate. The number of copies that may be produced by this electro-chemical action is almost unlimited, and the formation of the Prussian blue lines is, of course, instantaneous.—*Nature*.

FAT PEOPLE.—Not long ago, a gentleman of threescore, who had scarcely ever been sick in his life, thought he was too fleshy and began to Bantamize. He succeeded famously, and boasted to his friends that he had got rid of ten pounds in a few weeks. A little later he was attacked with a painful and dangerous malady, from which he has been suffering more than a year.

If a man can sleep soundly, has a good appetite, with no unpleasant reminders after meals, the bodily habits being regular every day, he had better leave himself alone, whether he is big as a hoghead or as thin and dry as a fence rail.

Several cases of Bright's disease have been reported by medical men of reputation as a direct result of practising Bantam's plan for getting lean. The very best and safest way to get rid of fat is to work it off. This may be aided by eating food which contains a large amount of nitrogen and a small amount of carbon.

Nitrogen food is that which gives strength, power to work, as lean meats; carbonaceous foods are those which make fat, such as cheese, potatoes, rice, corn, peas, beans, tapioca, arrowroot, cornstarch, milk, sugar, syrup, and all oily and fat food. Raw fruit and berries largely eaten are great aids to reducing weight.

But, after all, the great reliance should be on exercise and work in the open air. Barclay, the great English pedestrian, who performed greater feats than Weston, lost ten pounds in

two or three days' walking, and was never the worse for it.—*Hall's Journal of Health*.

BONE FELON ARRESTED BY CONGELATION.—Dr. James B. Walker, of St. Louis, Mo., says, in the *Medical Advertiser*: Not long since I was consulted by a young lady who was suffering from an incipient felon. The distinguishing characteristics of the painful affection were already manifest—pain, throbbing, some tumefaction, and the nervous excitement, indicated plainly what was in advance, unless the inflammation was arrested; and the command was: Arrest it at all hazards.

The starting point had been two days previous to her application for treatment. I could think of nothing offering such a prospect of success as cold, as low as the freezing point. Adding equal parts of snow and salt in a tumbler, I placed the finger, it being the middle one, in the freezing mixture. For a few seconds, there was an increase of the sensibility of the part, and it was with difficulty I could persuade her to hold her finger in the mixture. By degrees the pain subsided, and, at the end of two minutes, perfect insensibility had followed. I removed the finger, and after a few minutes the sensibility returned, and with it came the pain, throbbing, etc. The application was renewed, and the pain again ceased and insensibility ensued. This was repeated as often as the pain returned, and in about two hours, alternating the application and removal, there was no return of the painful sensations, and the difficulty entirely ceased and there was no felon. The induration remained several days, and the skin gradually exfoliated.

CURIOUS PHENOMENON OF RECURRENT VISION.—In the course of some experiments with a new double-plate Holtz machine, says Prof. Young of Dartmouth College in the *American Journal of Science*, I have come upon a very curious phenomenon which I do not remember ever to have seen noticed. The machine gives easily intense Leyden jar sparks from 7 to 9 inches in length, and of most dazzling brilliance, when, in a darkened room, the eye is screened from the direct light of the spark, the illumination produced is sufficient to render everything in the apartment visible; and what is remarkable, every conspicuous object is seen twice at least, with an interval of a trifle less than one-quarter of a second—the first time vividly, the second time faintly; often it is seen a third, and sometimes, but only with great difficulty, seen a fourth time. The appearance is precisely as if the object had been suddenly illuminated by a light at first bright, but rapidly fading to extinction, and as if, while the illumination lasted, the observer were winking as fast as possible. I see it best by setting up in front of the machine, at a distance of 8 or 10 feet, a white screen having upon it a black cross with arms about 3 feet long and 1 foot wide. That the phenomenon is really subjective, and not due to a succession of sparks, is easily shown by swinging the screen from side to side. The black cross, at all periods of visibility, occupies the same place and is apparently stationary. The same is true of a stroboscopic disc in rapid revolution: it is seen several times by each spark, but each time in the same position. There is no apparent multiplication of a moving object of any sort. Measuring roughly the interval between the successive instants of visibility, in my own case the mean of 12 experiments gave 0.22 sec., as the interval between the first and second seeing of the cross upon the screen; separate results varying from 0.17 to 0.30 sec. Another observer found a mean interval of 0.24 sec. Whatever the true explanation may turn out to be, the phenomenon at least suggests the idea of a *relaxation of the nervous impulse* at the nerve extremities—as if intense impression upon the retina, after being the first time propagated to the brain, were there reflected, returned to the retina and from the retina travelling again to the brain renewed the sensation. I have ventured to call the phenomenon "recurrent vision." It may be seen, with some difficulty, by the help of an induction coil and Leyden jar, or even by simply charging a Leyden jar with an old-fashioned electrical machine, and discharging it in a darkened room. The spark must be at least an inch in length.

READING IN RAILWAY CARS.—The *Philadelphia Medical and Surgical Reporter* has the following sensible remarks on this subject, and we commend them to the attention of all who ride much by rail: Most, if not all who read on railroads, are sensible of weight and weariness about the eyes. This sensation is accounted for on high medical authority by the fact that the exact distance between the eyes and the paper cannot be maintained. The concussions and oscillation of the train disturb the powers of vision, and any variation, however slight, is met by an effort at accommodation on the part of the eyes. The constant exercise of so delicate an organ of course produces fatigue, and if the practice of railroad reading is persisted in must result in permanent injury. Added to this difficulty is bad or shifting light. The safe and prudent mode is to read little if any. The deliberate finishing of volumes in railway cars is highly detrimental.

AURORAS.—Although auroras, says the *Mechanics Magazine*, are much more frequently seen in latitudes north of ours than in our own, the North Pole is not the region around which the most splendid and magnificent displays of the northern lights are to be seen. As we travel further north from England, auroras become more and more common until a certain latitude has been reached, after which they become less frequent. And, strangely enough, the region in which the display is most commonly to be seen lies further north in some longitudes than in others. For example, an inhabitant of St. Petersburg would have to travel northwards to within 19 degrees of the Pole before attaining the region of the most frequent auroral displays. On the other hand, an inhabitant of Washington need only travel northwards to latitude 56 degrees to reach the place of the greatest auroral action. If we took a globe and marked down all the spots thus obtained, we should find that they formed a nearly circular band within which the North Pole would occupy a very eccentric position. In fact, we could represent the position of the band very well by constructing a ring of card or paper of such dimensions as to agree with the sixtieth parallel of latitude, and then pushing the ring down on the side of America and upwards on the side of Asia, until it passed through the most southerly part of Hudson's Bay and the most northerly part of Siberia. When fully formed, the auroral arch is a most symmetrical and beautiful apparition. It surrounds a space of slate-coloured light, and from the arch itself luminous streamers dart with a quivering motion towards what is termed the magnetic meridian. Sometimes the ends of the arch are bent downwards near the horizon; but at others they are bent in a contrary direction. Hansteen relates that when he was at

Christiana he twice saw the auroral arch in the form of a complete oval. Sometimes more than one arch has been seen. On one occasion the observers, who were sent by the French Government to winter at Bossekop, in Finland, saw no less than nine arches, separated by dark spaces, "and resembling in their arrangement magnificent curtains of light, hung behind and below each other, their brilliant folds stretching completely across the sky."

CHESS.

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

TO CORRESPONDENTS.

R. M. B. Toronto.—Solution received, correct.

We continue our record of the matches by telegraph, played lately with two games between Hamilton and Seaforth.

SCOTCH GAMBIT.

| Hamilton. | Seaforth. |
|------------------------|-------------------|
| White, Mr. W. H. Judd. | Black, Dr. Verco. |
| 1. P. to K. 4th | P. to K. 4th |
| 2. K. Kt. to B. 3rd | Q. Kt. to B. 3rd |
| 3. P. to Q. 4th | P. takes P. |
| 4. B. to Q. 5th | B. to Q. B. 4th |
| 5. Kt. to Kt. 5th | Kt. to K. R. 3rd |
| 6. B. takes P. ch. | Kt. takes B. |
| 7. Kt. takes Kt. | P. to K. Kt. 3rd |
| 8. Q. to K. 5th ch. | P. to Q. 4th |
| 9. Q. takes B. | B. to K. 3rd ch. |
| 10. Castles. | Q. to K. 2nd ch. |
| 11. P. to K. B. 3rd | Kt. takes Q. |
| 12. Q. takes Q. ch. | Kt. to Kt. 5th |
| 13. R. to K. R. 5th | P. to Q. B. 4th |
| 14. B. to K. B. 4th | K. to Kt. 2nd ch. |
| 15. Q. Kt. to Q. 2nd | K. to B. 2nd |
| 16. Q. R. to K. sq. | B. takes P. |
| 17. P. takes P. | Kt. to B. 2nd |
| 18. B. to K. sq. | Kt. to Q. 2nd ch. |
| 19. Kt. to K. 4th | R. takes B. |
| 20. B. takes R. | B. takes Kt. |
| 21. R. to K. 2nd | R. to K. sq. ch. |
| 22. B. takes B. | K. takes R. |
| 23. R. takes R. | Kt. to Q. Kt. 3rd |
| 24. P. to K. B. 3rd | Kt. to Q. B. 5th |
| 25. P. to K. Kt. 3rd | Kt. to K. 5th |
| 26. P. to Q. Kt. 3rd | Kt. to K. 2nd |
| 27. R. to K. B. 2nd | K. to K. 3rd |
| 28. R. to Q. 2nd | K. to Q. 4th |
| 29. K. to B. 3rd | P. to K. R. 4th |
| 30. P. to K. R. 3rd | P. to Q. Kt. 4th |
| 31. P. to K. Kt. 4th | P. to Q. B. 5th |
| 32. P. to Q. B. 3rd | Resigns. |

(a) This variation is now considered superficial and hazardous.
(b) An error, apparently slight, but the consequences of which are seen throughout the game. P. takes P. is the correct move, and if defence has admitted the better opening.

(c) Well played: Black cannot now take the pawn with safety, the subsequent moves in attack are in the best style.

(d) Losing time;—better have played Kt. to K. 2nd.

(e) The best move left: Black must now lose the exchange of pieces.

(f) Kt. to B. 3rd, followed by R. to Q. B. sq. seems to promise more prolonged resistance.

SCOTCH DEFENCE.

| Seaforth. | Hamilton. |
|----------------------|--------------------------|
| White, Dr. Smith. | Black, Mr. W. F. Mackay. |
| 1. P. to K. 4th | P. to Q. B. 4th |
| 2. P. to Q. 4th | P. takes P. |
| 3. K. Kt. to B. 3rd | Q. to B. 3rd |
| 4. Kt. takes P. | P. to K. 4th |
| 5. Kt. takes Kt. ch. | Kt. to K. 3rd |
| 6. B. to Q. B. 4th | Kt. to K. B. 3rd |
| 7. Castles. | B. to Q. B. 4th |
| 8. B. to K. Kt. 5th | Castles. |
| 9. K. to B. sq. | P. to K. R. 3rd |
| 10. B. to B. 4th | P. to Kt. 4th ch. |
| 11. B. to Kt. 3rd | Kt. takes K. P. ch. |
| 12. B. takes K. P. | Kt. takes B. 1. ch. of |
| 13. R. takes Kt. | R. takes R. |
| 14. Q. to K. R. 5th | K. to B. 2nd |
| 15. B. takes B. P. | R. to Kt. 5th |
| 16. Q. to K. B. 3rd | R. to Kt. 2nd |
| 17. Q. to B. 4th ch. | Resigns. |

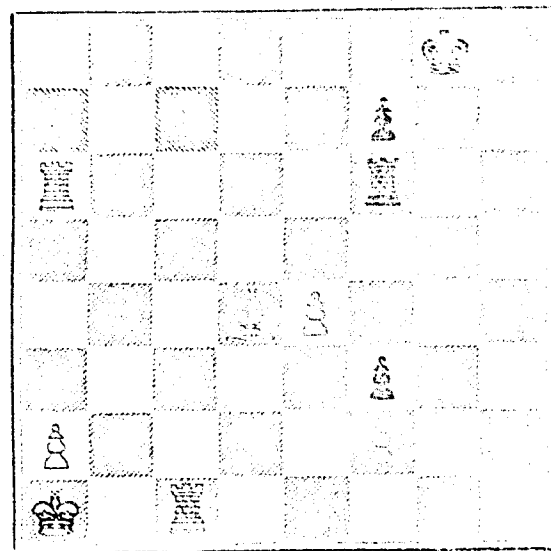
(a) Kt. to Kt. 5th is generally played here.
(b) The advance of this pawn, so early in the game, is always hazardous.

(c) This, and the succeeding move of Black, afford his adversary an opportunity for a strong attack, winning by force.

(d) P. to Q. 4th should have been played instead.

PROBLEM No. 49.

BLACK.



WHITE.

White to play and mate in three moves.

SOLUTION OF PROBLEM No. 48.

| White. | Black. |
|------------------------|------------------|
| 1. B. to Q. B. sq. | P. to Q. Kt. 4th |
| 2. P. to Q. Kt. 3rd | P. to Q. Kt. 5th |
| 3. R. to Q. 2nd | K. to B. 5th |
| 4. R. to Q. 4th, mate. | |

VARIATION.

| White. | Black. |
|------------------------|------------------|
| 1. B. to Q. B. sq. | P. to Q. Kt. 3rd |
| 2. P. to Q. Kt. 4th | P. to Q. Kt. 4th |
| 3. R. to Q. 2nd | K. to B. 5th |
| 4. R. to Q. 4th, mate. | |