

(0.2 per cent.) silver nitrate solution, the cut surface of the cortex will be seen to turn almost black within a short time, while the medulla, like other organs, remains practically uncoloured.

The purification of  $C_{211}$  was based on the following properties: it is readily extracted by methyl alcohol and precipitated almost quantitatively from its alcoholic (not from watery) solution by lead acetate. It shows a different solubility in organic solvents at acid or alkaline reaction. At an alkaline reaction it is readily soluble in water, methyl alcohol, sparingly in acetone, insoluble in ether and other more hydrophobe solvents, and is precipitated by these latter from its strong alcoholic solution. At acid reaction it is readily soluble in water, alcohol, and acetone, is not precipitated from alcohol by ether, but is carried down by this latter from an acetone solution. The substance does not form a precipitate with any of the great number of other precipitating agents applied. No colour reaction could be found. (The brown coloration on application of acid iodate, mentioned in the first paper, is caused by the liberation of iodine. My first impression that the substance was a thiophenol has been disproved, as no sulphur is found on analysis.) The substance has been crystallised in fine colourless needles from a hydrochloric acid solution, the crystals showing a constant melting-point of  $175^{\circ}C$ .

The  $C_{211}$  content of the adrenal gland (cow) is approximately 0.1 per cent. Preliminary experiments tend to show that the substance is not devoid of biological activity. My earlier experiments, showing that  $C_{211}$  is not the hormone of the adrenal cortex, seem in the light of Banting's and Rogoff and Stewart's recent work to be inadequate. Analysis of the biological significance and chemical constitution has been started. A full account of the methods of preparation will be given in another place.

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#### Behind the Divining Rod.

RECENT correspondents have not referred to the views that place the use of the divining rod in the category of 'psychological automatisms' like the use of planchette or divination by a ring suspended in a tumbler. A simple experiment will demonstrate such an automatism. An unsuspecting subject is directed to sit leaning forward with his elbows resting upon his knees and with his hands placed just below the level of his eyes. The end of a watch-chain is placed in his hands with the watch dangling between his separated knees, and he is now assured that the watch will swing from knee to knee. Any plausible explanation may be given—bodily magnetism, or the inner movements of the watch—and, unless the subject be critically disposed, the watch as he gazes upon it will swing with increasing amplitude in the direction named. In an experiment with a fresh subject the watch, by suitable assurance, may be made to swing at right angles to its path in the first case.

The movement is produced unwittingly by the muscular action of the subject. The divining rod, as I have seen it used, provides a delicate mechanism by which muscular action can produce movements that the subject apparently, and in his own belief, is trying to resist. I have described the method in "Spiritualism and the New Psychology" (Edward Arnold, 1920).

Testimony as to the honesty of the dowser adds to the pathological interest of the phenomenon; conscious fraud is less pathological than a mild dissociation of personality. Prof. Sollas rightly insists that in tests of ability to 'dowse' coins the investigator

himself should not know what they are, but there is no need to invoke telepathy. There is a super-acuity of the senses, in the presence of a mental dissociation, that enables the 'dissociated' subject to pick up the slightest indications from bystanders or otherwise.

The divining rod has had many uses: to find water, coal, ore, hidden treasure, criminals, and witches. Mechanically and psychologically it belongs to the same category as planchette. Pierre Janet dealt fully with this and other psycho-pathological manifestations in "L'Automatisme psychologique" (Paris: F. Alcan, 1889) and remarked (p. 368): "Il est probable que, dans quelques campagnes, subsiste encore la croyance aux révélations de la baguette divinatoire."

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#### Gallium in Flue Dust.

MR. W. KIRBY'S observation of the occurrence of the element mercury in coal-tar, recorded by Dr. Aston in NATURE of April 2, p. 489, is another instance of the wide distribution of an element in minute quantity. Employing the method of spectrum analysis by oxy-hydrogen or oxy-coal gas flames (Hartley and Ramage, *Trans. Chem. Soc.*, 71, 533, 1897, etc.) in a search for sources of potassium in flue dusts during the War, certain samples were found to contain notable quantities of gallium. Experiments have been made as occasion permitted to perfect a method for extracting that rare metal from Norwich Gas Works' flue dust, derived from South Yorkshire coal, and in the course of the work the presence of the following elements has been noted: lithium, sodium, potassium, rubidium, caesium, copper, silver, calcium, strontium, zinc, aluminium, gallium, indium, thallium, carbon, titanium, silicon, lead, vanadium, phosphorus, arsenic, antimony, bismuth, oxygen, chromium, molybdenum, sulphur, manganese, chlorine, iron, and nickel. Circumstances have not permitted a complete analysis to be made, and one substance, at least, awaits final purification and identification. Certain selected pieces of dust, partially fritted, apparently contain about 2 per cent. of gallium, and the proportions of zinc and vanadium are probably higher still.

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#### Distinctive Colour Senses of Artists.

THE article in NATURE of May 14 on the exhibition of the Royal Academy reminds me of a discussion I once had with a brother of Sir Charles Walston, who was a medical man interested in art. He was looking out for a method to determine the average colour of a picture, which he thought was characteristic of the painter, and might serve to identify him as certainly as finger-prints identify persons. I could only refer him to the method tried by the third Lord Rayleigh, when instead of spinning colour discs he looked at the stationary discs after reflexion from a surface that could be set into rotation. Applied to a painting, this would then give the average colour for concentric circles round the centre of rotation.

While I am writing, I am looking at portraits of two ladies made by the same artist. The dress of one is bright yellow, that of the other dark blue, and their average colour is not balanced by the colour of the background. The conclusion to be drawn is, that it is dangerous to mix science and art, though we may apply one to the other.

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May 18.